

Georgia Statewide Freight and Logistics Plan, 2010-2050

Task 5 Report



Freight Improvement Project Recommendations



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1.0 Introduction

This report describes the freight improvement project recommendations developed as part of the Freight & Logistics Plan. This report represents the documentation of work conducted for Task 5 in the Plan.

Freight improvement projects discussed in this chapter were identified through stakeholder outreach, reviewing recent transportation plans, and needs analysis conducted as part of earlier tasks in this study. Key projects were then analyzed individually and grouped into packages. The packages were further analyzed using an economic impact tool and the results were used to develop a list of priority freight packages for the State of Georgia.

The projects described in this chapter cut across all modes and regions in Georgia. Projects were identified by a variety of public sector and private sector stakeholders.

This report is structured as follows:

Chapter 1 - Introduction. This chapter describes the purpose of this report and describes how it is structured.

Chapter 2 - Identifying Potential Freight Improvement Projects. This chapter describes the freight improvement projects that were considered across each of the freight modes: marine ports, rail, highway, and air cargo. Additionally, the source of improvement projects is discussed.

Chapter 3 - Project Evaluation. This chapter describes the individual project evaluation process applied to the projects identified in Chapter 2.

Chapter 4 - Grouping Priority Freight Projects into Packages. This chapter describes how projects were selected as priority freight projects, and how individual projects were grouped together into packages. The packaging process is most relevant for the highway mode.

Chapter 5 - Economic Benefits of Freight Packages. This chapter estimates the economic benefits of the freight packages identified in Chapter 4. Economic benefits were generated in terms of economic output and/or increased jobs and returns on investment are generated.

Chapter 6 - Summary Freight Recommendations. This chapter compiles the priority freight packages into a single framework and provides information on funding options for the freight program. It also discusses ITS and other operational programs that support the effectiveness of existing transportation infrastructure in increasing the safety and efficiency of goods movement in Georgia.

2.0 Identifying Potential Freight Improvement Projects

Projects to consider in this plan came primarily from three sources:

- Outreach to the private sector – including surveys of the private sector conducted in 2010 and input from the Plan’s Private Sector Advisory Committee;
- The Plan Development Committee which includes the GDOT Office of Planning and Office of Intermodal Programs, the Governor’s Office, the Georgia Center for Innovation in Logistics; the Federal highway Administration (invited); and
- Previous freight-related reports conducted in Georgia including the Georgia Statewide Strategic Transportation Plan, the GDOT Statewide Transportation Plan, and Metropolitan Planning Organization Long Range Transportation Plans and Freight Plans (if available).

The projects considered for additional analysis are categorized by mode as follows:

- Port improvement projects;
- Rail improvement projects;
- Highway improvement projects which can be further sub-classified as long-haul corridors, interstate interchange improvements, controlled-access bypass facilities, smaller urban and urban freight highways, and safety projects; and
- Air Cargo improvement projects.

2.1 PORT IMPROVEMENT PROJECTS

The Port of Savannah is a critical facilitator of international trade. It provides access to global customers for companies based in Georgia. It also provides internationally produced goods to the shelves of stores across the State. Continued growth of the Georgia economy combined with continued growth in international trade has the potential to increase port traffic from its current 2.9 million annual TEUs to over 16 million annual TEUs in 2050.

To most efficiently move these goods, the Savannah River will need to be deepened. This will allow the Port of Savannah to accommodate the increasingly larger cargo and vessel types calling the U.S. East Coast. The frequency of these

larger ships will grow dramatically after the Panama Canal completes its own deepening and widening project in 2015.

The Savannah Harbor Expansion Project (SHEP) was mentioned by the Private Sector Advisory Committee as the most important freight-related project in Georgia. It also enjoys broad support from elected officials across the state.

Regardless of the status of SHEP, the Garden City terminal at the Port of Savannah is projected to experience continued growth and will reach capacity in the not-to-distant future. The states of Georgia and South Carolina are working together to develop a new port in Jasper County, SC -- commonly called the Jasper Ocean Terminal -- to accommodate the continued container growth; this project is considered to be a longer-term marine port need in the Freight & Logistics Action Plan.

2.2 RAIL IMPROVEMENT PROJECTS

Railroads are a key feature of Georgia's freight landscape. Atlanta is the hub for southeast rail operations for both Class I railroads in the eastern half of the U.S. -- CSX and Norfolk Southern. For the Port of Savannah, rail is used to connect with shippers across the State. Atlanta metro is the top intermodal rail trading partner for the Port of Savannah shipping and receives 33% of the total intermodal rail containers through the port. Roughly half of the carload rail traveling through the port connects with Georgia destinations outside of Atlanta. Carload rail includes bulk commodities such as timber/wood products, broilers (frozen chickens), peanuts, cotton and kaolin. Increased economic activity in Georgia will drive additional demand for freight rail services. These demands will outstrip current capacity and require improvements in freight rail infrastructure to ensure that freight rail continues to be a cost-effective modal option for Georgia shippers.

Freight rail improvement projects were considered in three categories:

- Recent and Current Investments by Class I Railroads;
- Specific projects needed to address current deficiencies; and
- Conceptual projects considered as part of a longer-term rail program to capture future growth opportunities

Recent and Current Initiatives by Class I Railroads

Norfolk Southern (NS) recently initiated Phase I of their Crescent Corridor improvement project to provide better intermodal rail services between the Northeast, the Mid-Atlantic, and the Southeast. Phase I includes the development of new intermodal railyards in the Charlotte and Memphis regions. As part of Phase II of this program, the Crescent Corridor will increase intermodal rail travel speeds for the rail line running between Charlotte, Atlanta, and Birmingham. Phase III will include enhancements to the Austell intermodal

rail yard immediately northwest of Atlanta. Developing the Crescent Corridor is considered one of the freight improvement projects supported in the Georgia Freight & Logistics Action Plan.

Over the last decade, CSX has made significant improvements to its rail lines in Georgia. Their recently completed southeast strategy included over \$1 billion of improvements in their Atlanta-Birmingham rail line and their north-south rail line that includes their Waycross classification yard and connections of Georgia with Florida and the Midwest. Adjacent to the Southeast region is a major forthcoming CSX initiative known as the National Gateway; it is a multi-stage rail construction project that will make improvements to improve double-stack abilities. Within Georgia, in 2012 CSX invested over \$114 million on its network in the state.¹

Current Deficiencies – Class I Railroads and Shortline Railroads

Current deficiencies in Georgia’s rail network are detailed in the Rail Modal Profile conducted as part of Task 3 of this Plan. The deficiencies include sections of rail track with substandard weight limits and vertical clearances.

The industry standard railcar weight for bulk commodities such as grain, lumber, coal, and paper products, has trended in recent years from 263,000 pounds to 286,000 pounds (commonly referred to in the industry as “286K”). While most of the Class I rail lines have achieved 286K capability, many short line railroads in Georgia are not capable of handling 286K railcars. Railcar weight limits for Georgia’s Class I and short line railroads, as available, are illustrated in Figure 2.1. Upgrading lightweight rail track to 286K is a key freight rail improvement project in this Plan.

The CSXT Cartersville Subdivision, a branch connecting the CSXT Etowah Subdivision with the NS Cedartown Subdivision located in northwest Georgia, is the only segment of the CSXT network in Georgia that is not 286K-capable. The NS network is primarily capable of accommodating 286K railcars as well. Exceptions are limited to the Moores Subdivision in Augusta and the Dublin Subdivision, which is approximately 35 miles of track that connects the NS Savannah Subdivision near Sandersville and the Georgia Central near Dublin. Several short line railroads lack 286K capacity, and weight limit data for several other Georgia short line railroads remain unknown.

Much of Georgia’s rail infrastructure was originally built to accommodate rail cars with a height of 15 feet. With the general adoption of larger railcars such as tri-level auto carriers and double-stack intermodal cars, vertical height standard industry requirements have trended to upwards of 20 feet, and the defined height for fully unrestricted clearance was raised to 22’ 6”. A minimum height of 20’ 8” can accommodate a pair of stacked domestic containers (each 9’6” high)

¹ www.csx.com/index.cfm/about-csx/company-overview/state-fact-sheets/georgia

and has become a defacto minimum standard for vertical clearance for main lines handling intermodal traffic.

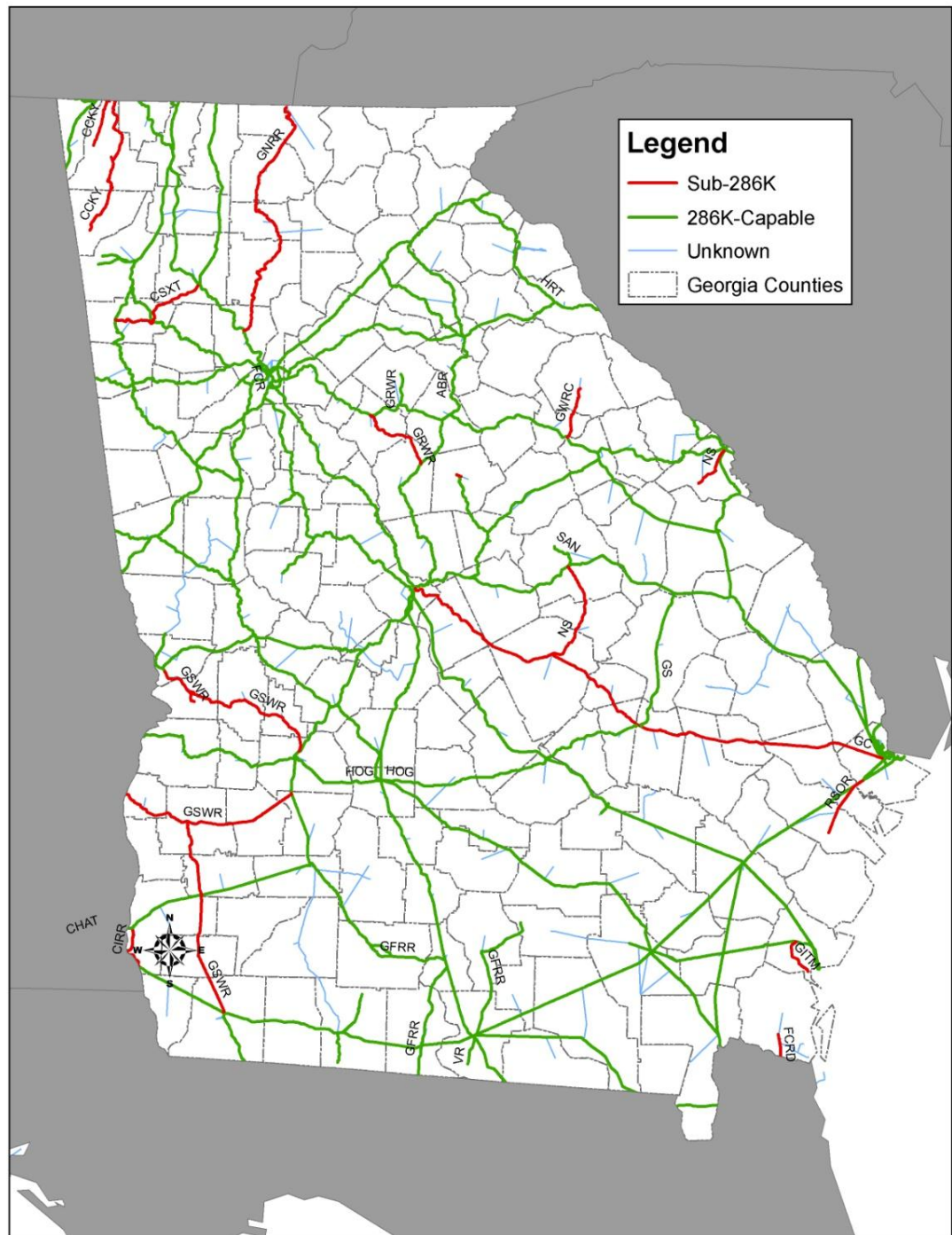
Due to bridges and other obstructions, many rail lines in Georgia do not meet this requirement. Vertical clearances on CSXT, NS and many of the State's short line railroads are mapped in Figure 2.2. Increasing vertical height clearance to the 20' 8" minimum standard for vertical clearance is another freight rail improvement project in this Plan.

Approximately 95 percent of all mainline trackage, including Class I and short line railroad trackage, in Georgia are single-track. Class I routes have passing/sidings at regular intervals, which allow trains moving in opposite directions or at different rates of speed to pass one another. While this arrangement is effective for traffic volumes that have historically occurred over Georgia's main lines, as traffic increases and/or there is a greater mix of different types of trains, full double track becomes a consideration. As needed, double tracking key rail segments in the state is a freight rail improvement project recommended as part of this Plan.

In addition to the number of main line tracks, another important attribute affecting main line capacity is the type of traffic control system. Railroads in Georgia primarily make use of three different signal systems to control traffic movements on their systems. These are Manual, Automatic Block Signals (ABS), and Centralized Train Control (CTC). CTC systems permit the dispatcher to remotely manage train movements by controlling signal indications and train routing over a geographic jurisdiction such as a subdivision or terminal area. CTC is layered on top of an ABS system, which provides occupied block protection. Implementation of CTC leads to considerable capacity improvements, and is almost always taken as a first less costly step when traffic increases call for increased line capacity. The coverage of CTC systems will need to increase to manage increased volumes and increased double tracking across the state. This will increase the efficiency of rail operations in terms of average speeds and total travel times between origins and destinations.

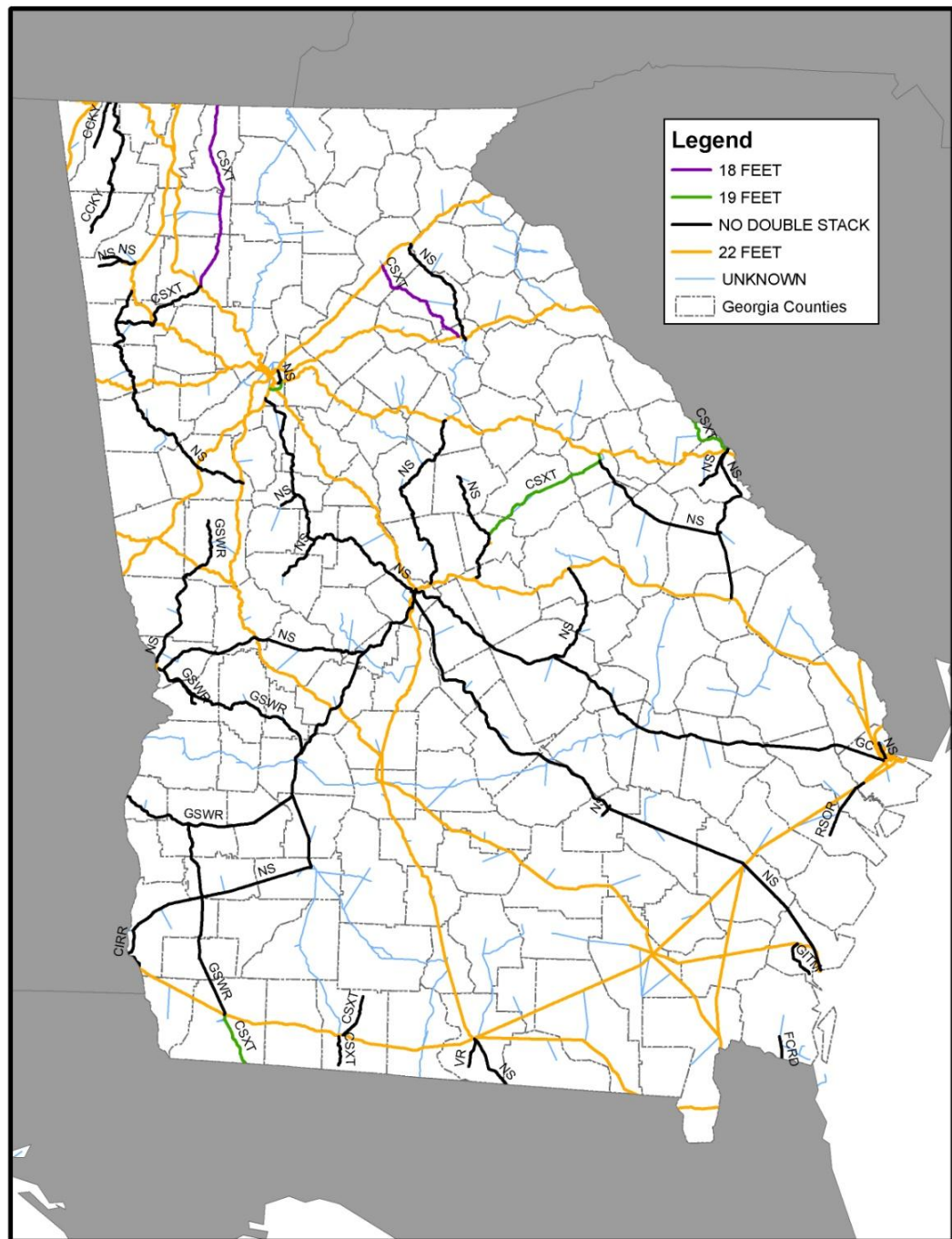
These rail improvements taken together represent a series of steps that would begin to address the rail system bottlenecks identified in this Plan. These bottlenecks are shown in Figure 2.3 with the rail track in red the priority rail track in need of improvements to accommodate future demand.

Figure 2.1 Rail Line Weight Limits – Class I and Shortline Railroads



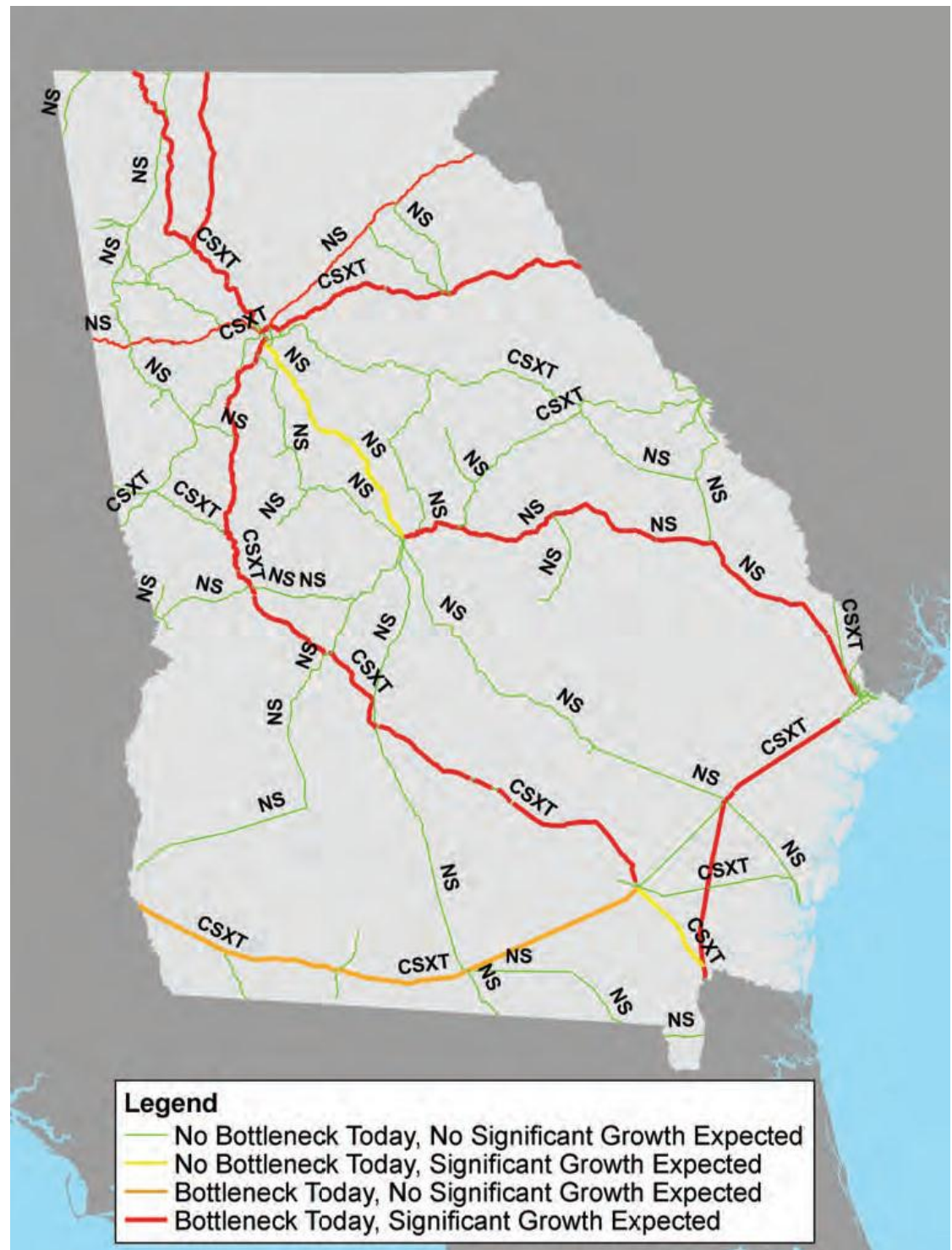
Source: Interviews with Class 1 Railroads, American Shortline Railroad Association, Project team Analysis.

Figure 2.2 Vertical Clearance Heights – Class I and Shortline Railroads



Source: Interviews with Class 1 railroads, American Shortline Railroad Association, Project team analysis.

Figure 2.3 Rail System Throughput Bottlenecks – Class I Railroads



Source: Interviews of Class 1 railroads, Project team analysis.

Long-Term Rail Program

Improving the deficiencies mentioned would be part of a long-term rail program to ensure that future growth can be captured by the Class I and shortline railroads. Determining specific projects out to the 2050 horizon year is outside of the normal planning process for Class I and shortline railroads and therefore individual projects over this period are not specified as part of this Plan. However, the 2007 American Association of Railroads (AAR) developed the National Rail Freight Infrastructure Capacity and Investment Study which provides a sense of the magnitude of the infrastructure issues facing the railroads over the long-term.

The AAR study estimated that an investment of \$148 billion would be needed nationally for freight rail infrastructure expansion between 2007 and 2035. An estimate of the costs to make these long range improvements in Georgia was developed by adjusting the AAR report timeline to the 2012 to 2050 timeline of the Freight & Logistics Action Plan and then factoring down the costs based on the amount of rail track in Georgia relative to the rest of the U.S. Putting a reasonable lower and upper bound on this process gives us an estimate of between \$4 billion and \$6 billion of rail capacity enhancements needed in Georgia between 2012 and 2050 to accommodate future demand in the state.

These costs include the following improvements in the system:

- Line haul expansion;
- Major Bridges, Tunnels, and Clearance;
- Branch Line Upgrades;
- Intermodal Terminal Expansion;
- Carload Terminal Expansion; and
- Service Facilities.

The AAR report estimates that 70 percent of the total national costs are for line haul expansion and 14 percent of the national costs are for major bridges, tunnels and clearances. These two categories are likely the largest categories of freight rail improvements needed in Georgia over the long term as well.

2.3 HIGHWAY IMPROVEMENTS

Five types of highway improvement projects were identified as part of this Plan:

- Long-haul interstate corridors;
- Interstate interchanges;
- Urban bypasses;
- Smaller urban and rural freight corridors; and
- Highway safety projects.

Long-Haul Interstate Corridors

Due to the long distance nature of a large component of truck trips, long-haul interstate corridors in Georgia are particularly important for trucks and the overall movement of goods. Earlier analysis of the interstate system using the GDOT statewide travel demand model indicated that there will be significant long-haul bottleneck “segments” on the highway system in the year 2050 if no highway improvements are made to the system due to continued growth of truck and auto traffic volumes.

Long-haul interstates are considered to be the segments of the interstate between urban regions with the minimum number of lanes for the interstate. For example, the I-75 Atlanta-to-Tennessee long-haul corridor is the interstate segment between Atlanta and Chattanooga that has a total of six through lanes. The urban portion of the corridor in the Atlanta region that is more than six lanes is not part of the long-haul corridor. Similarly, the I-75 Atlanta-to-South Carolina long-haul corridor is the interstate segment between Atlanta and the Georgia-South Carolina state line that currently has a total of four lanes. The list of the long-haul corridors examined was:

- I-75 Atlanta-to-Tennessee
- I-85 Atlanta-to-South Carolina
- I-20 Atlanta-to-South Carolina
- I-75 Atlanta-to-Macon
- I-75 Macon-to-Florida
- I-16 Macon-to-Savannah
- I-85 Atlanta-to-Alabama
- I-20 Atlanta-to-Alabama
- I-95 South Carolina-to-Florida

NOTE: Georgia’s Bottleneck Segments are part of “long haul” corridors analyzed later in this document; also see Table 6.2 of the study’s Task 3 Truck Modal Profile.

Interstate Interchanges

Interstate interchanges are often the source of operational and capacity issues in the highway system. For trucks, traveling across interstate interchanges can be particularly problematic due to the increased time required to change speeds and operational issues created as large vehicles merge. Additionally, the longer average trip length of trucks results in the average truck trip encountering more interstate interchanges than other vehicles. Therefore, improving road geometry and bottleneck “hotspots” at interstate interchanges is beneficial to all vehicles, but particularly beneficial for truck mobility.

There are several well-known analyses of truck bottleneck “hot spots” referenced by freight practitioners that have been done over the past several years. Those unique to Georgia were discussed in section 6.3 of the Freight and Logistics Plan’s Task 3 memo *Truck Modal Profile*. A listing of these nationally-ranked Georgia “hot spots” locations is repeated in Table 2.1 on the next page.

In addition, during the development of the Georgia Freight & Logistics Plan the I-16 @ I-75 interchange in Macon was cited by private sector stakeholders as particularly problematic; travel from I-75 southbound to I-16 eastbound *and* from I-16 westbound to I-75 northbound have operational issues. This interchange includes a single-lane, southbound left-hand exit to I-16 requiring significant lane changes for trucks and autos; this is important considering this interchange is used by many trucks daily to/from Port of Savannah and metro Atlanta. The interchange is also used by the many trucks traveling between the port and growing warehouse/distribution activities south of Macon.

In the Savannah region, the interchanges at I-95 @ I-16 and I-95 @ State Route 21 were identified in the 2008 GDOT Chatham County Interstate Needs Analysis & Prioritization Plan as being major issues for both trucks and autos, and are included in Table 2.1. The I-95 @ I-16 interchange is used by many port-related trucks traveling to inland destinations; I-95 @ State Route 21 is used by port-related trucks traveling to inland destinations north of the port. Similar to I-16 @ I-75, these interchanges experience heavy auto volumes and congestion.

Table 2.1 Georgia’s Major Bottleneck Hotspots

Location	GDOT Project (<i>Recently Done</i> and/or <i>Proposed</i>)
Atl., GA: I-285 @ I-85 (North metro)	<u>Proposed</u> : Interchange reconstruction project in Atlanta MPO’s Long Range Trans. Plan (LRTP).
Atl., GA: I-285 @ I-75 (North metro)	<u>Proposed</u> : Interchange reconstruction project in Atlanta MPO’s LRTP. Also, “N.W. Corridor” project (adds corridor capacity) in Atlanta MPO’s LRTP & Trans Imprvt. Prog (TIP)
Atl., GA: I-285 @ I-20 (East metro)	<i>Recently Done: new eastbound Collector-Distributor (“C-D”) lanes added</i> <u>Proposed</u> : Interchange reconstruction & westbound C-D lanes project in Atlanta MPO’s LRTP & TIP
Atl., GA: I-75 @ I-85 (North metro)	<i>Recently Done: Mainline improvement & southbound C-D lane added (w/17th St. bridge project)</i>
Atl., GA: I-20 @ Fulton Industrial Blvd.	<u>Proposed</u> : Widening of Fulton Industrial Blvd. through I-20 interchange in Atlanta MPO’s LRTP
Atl., GA: I-285 @ State Route 400	<u>Proposed</u> : Full interchange reconstruction plus new C-D lanes projects in Atlanta MPO’s LRTP
Atl., GA: I-285 @ I-20 (West metro)	<u>Proposed</u> : Interchange reconstruction project in Atlanta MPO’s LRTP & TIP
Atl., GA: I-20 @ I-75/85 (Downtown)	<u>Proposed</u> : GDOT Office of Planning will be initiating an operational improvement study in FY 2015 <i>Recently Done: install southbound ramp meters @ Freedom Pkwy...operations / lane restriping</i>
Atl., GA: I-75 @ I-675	<i>Recently Done: new Southbound auxiliary lane added</i> <i>Recently Done: new Northbound auxiliary lane added; Express-lane project under construction</i>
Macon, GA: I-75 @ I-16	<u>Proposed</u> : Interchange reconstruction project in Macon MPO’s LRTP & TIP
Savannah, GA: I-95 @ I-16	<u>Proposed</u> : Interchange reconstruction project in Savannah MPO’s LRTP & TIP
Macon, GA: I-75 @ I-475	<i>Recently Done: Adjacent Hartley Bridge Interchange reconstructed and I-75 mainline widened</i>
*Savannah, GA: I-95 @ State Route 21	<i>Recently Done: new Northbound shoulder/auxiliary lane added</i> <u>Proposed</u> : Interchange operational improvement project in Savannah MPO’s LRTP & TIP. Also, full interchange reconstruction proposed in Savannah MPO’s LRTP

Several bottlenecks in Table 2.1 have previously been recognized as recommended freight projects and addressed by GDOT through recently-implemented improvements. In addition, there are many existing or proposed GDOT improvement projects at various stages of development whose continued pursuit is recommended by the Georgia Statewide Freight and Logistics Plan.

While not identified on national-level bottleneck “hot-spot” lists, other projects are recommended that will improve local- and regional-level bottlenecks:

Table 2.2 Other Georgia Bottleneck Hotspots and Associated Projects
Examples Identified by State and/or Local Plans

Location	Freight Issue(s)	Proposed Project Type & Status
State Route 307 at Georgia Ports Authority railroad (Savannah, GA)	Existing at-grade rail crossing very close to the main truck gate at the Port of Savannah. The crossing is located on a major state route that provides the truck access to that main gate. Crossing also limits improvements to a much-needed expansion of the adjacent Georgia Ports Authority intermodal yard.	Recommended Project: Rail grade separation eliminating delays on State Route 307 for port-bound trucks due to slow-moving intermodal trains that enter/exit adjacent Ports Authority intermodal yard. Project allows expansion of that adjacent intermodal yard--resulting in 2 hours cut from one-way intermodal rail trip to Atlanta. ² Status: BUILT/COMPLETED
I-85 @ State Route 74 in Fairburn, Ga. (South metro Atlanta)	Capacity & operational needs; interchange provides I-85 access to expanded CSX Railroad Intermodal yard track expansion: www.dca.state.ga.us/dri/AppSummary.aspx?driid=2326 Interchange on US DOT-designated intermodal connector route (truck/rail facility GA32R).	Recommended Project: Interchange Reconstruction Status: Project listed in Atlanta MPO's Long Range Transportation Plan (LRTP). Also is a recommended freight project in the recently-completed South Fulton Comprehensive Transportation Plan ³ .
I-285 @ I-75 (South metro Atlanta)	Improve operations on a major system-to-system interchange with very significant northbound I-75 to westbound I-285 truck movements.	Recommended Project: Operations Improvement: add C-D ramps. Status: Project in Atlanta MPO's LRTP & TIP.
I-75 @ Lake Park-Bellville Road (Exit 2 in Lake Park, Ga.)	Capacity & operational needs--especially for trucks. Interchange serves nearby 658,000ft. ² Home Depot “rapid deployment” distribution center w/400 employees receiving 120 trucks per day and serving 150 stores southeast ⁴ . In addition, multiple full-service truck stops adjacent to both sides of existing interchange.	Recommended Project: Interchange Reconstruction Status: Project listed in Valdosta MPO's LRTP and TIP.

² <http://savannahnow.com/exchange/2012-08-01/highway-307-overpass-garden-city-terminal-divert-port-traffic>

³ www.southfultonctp.org

⁴ www.georgia.org/news-room/governor-perdue-participates-in-board-cutting-for-lowndes-county-home-depot-distribution-center

I-16 @ State Route 307 (Savannah, Ga.)	This is the main interchange for trucks traveling between interstate system and main gate at Port of Savannah.	Recommended Project: Interchange Reconstruction Status: Listed in GDOT's Chatham Co. Interstate Needs Analysis & Prioritization Plan ⁵ .
State Route 6 "Truck Friendly" lanes (metro ATL)	Last-mile route from I-20 to Norfolk Southern intermodal yard proposed for expansion through Norfolk Southern's "Crescent Corridor" initiative.	Recommended Project: Corridor improvement Status: In Atlanta MPO's LRTP & TIP; recommended in State Route 6 Corridor Study ⁶ . Corridor on state-designated State Freight Corridors list.
Jimmy Deloach Parkway Extension from US 80 to I-16, including new US 80 interchange	Route is continuation of Jimmy Deloach Pkwy. (see Table 4.1 re: last-mile truck access from Port of Savannah to I-95). Proposed extension provides direct connectivity to I-16 via existing interchange @ exit 152 and includes rail grade separation over Georgia Central Railway (one of the 2 shortline railroads connecting Cordele intermodal terminal to the port).	Recommended Project: New road & Interchange Status: In Savannah MPO's LRTP and TIP. Approved freight project as included in the region's Georgia Transportation Investment Act of 2010 approved project list. ⁷ Corridor included on Georgia's adopted State Freight Corridors list and GRIP routes list.
State Route 17 and US 1	Two existing non-interstate rural north-south corridors that will experience increasing truck volumes by the year 2050, especially those sections south of Washington, Georgia to I-16.	Recommended Project: Roadway widening of state-designated Freight Corridors (see page 6-5) State Route 17 and US 1. [State Route 17 and US 1 work together to provide non-interstate north-south freight movement: near Wrens, Georgia, trucks on US 1 continue north-south travel on US 17 to access I-20 and Washington, Georgia.] Status: Listed in several Transportation Investment Act of 2010-approved project lists ⁸ & GDOT State Transportation Improvement Program. ⁹
State Route 72	Significant non-interstate corridor & state-designated Freight Corridor providing connectivity between metro Athens & South Carolina. SR 72 works w/SR 316 as east-west corridor connecting to I-85/metro Atl.	Recommended Project: Roadway widening. Status: This is a bi-state corridor widening coordinated with South Carolina DOT's adjacent State Route 72 widening project ¹⁰ .

⁵ www.dot.ga.gov/Projects/studies/Documents/chatham_interstate_study/MPO_Presentation_June_2008.pdf

⁶ http://comdev.cobbcountyga.gov/documents/SR6_Final-Rpt_1-8-08.pdf

⁷ www.thempc.org/documents/Transportation/HB%20277/HB_277_project_CORE_MPO_submittal_Revised.pdf

⁸ www.ga-tia.com/Images/FactSheets/CSRA-finalinvestmentlistreport.pdf

⁹ www.dot.ga.gov/Projects/programs/Pages/STIP.aspx

¹⁰ www.fhwa.dot.gov/environment/environmental_justice/case_studies/case10.cfm

Examples of Implementation Successes

In addition to the first project listed in Table 2.2, there are several other examples of recent freight project ‘success stories’ worth mentioning. Specifically, they involve several examples of local/regional interchange projects with freight components that have been completed. Two are in metro Atlanta and involve the existing congested interchanges of I-285 at Ashford-Dunwoody Road and I-85 at Pleasant Hill Road. These interchanges serve the large regional shopping malls of Perimeter Center Mall and Gwinnett Place Mall, respectively.

Both locations were improved by converting their operation to diverging-diamonds interchanges: I-285 at Ashford-Dunwoody was completed in mid-2012 and I-85 at Pleasant Hill in mid-2013. While both locations experience high car volumes, they are also freight-related bottlenecks considering the significant number of daily truck trips made to these locations to deliver goods and supplies to merchants, restaurants and related businesses: there is approximately 6 million square feet of retail space currently located in the Perimeter Center Mall area and 4 million associated with the Gwinnett Place area. Many truck deliveries to all this retail space happen daily to supply the operations of all area businesses, which are open seven days a week. There is already evidence that the improvements are reducing congestion and delay.¹¹

Urban “Bypasses”

While 75 percent of the total freight tons in Georgia have an origin and/or a destination in the state, there are 25 percent of freight tons that are ‘through trips’ with both trip ends outside the state. For example, nearly 9,000 trucks per day travel through the state on I-95, almost 5,000 trucks per day travel through the state on I-75 and 6,000 trucks per day travel east-west through the state using I-85 and I-20. This “through” freight traffic contributes to congestion on both the highway and rail networks in Georgia. It also contributes to wear-and-tear of the physical infrastructure and contributes to emissions. Developing alternative paths that can be utilized for this traffic may support freight travel reliability and preserve existing infrastructure for freight traffic that is directly tied to economic activity in the State.

This concept led to the consideration of potential “bypasses” around urban areas as a possible freight improvement projects. Additionally, the Private Sector Advisory Committee also identified traveling around Atlanta as a major impediment to the free flow of freight. Based on this input several urban “bypasses” were added to the evaluation list as shown in Figure 2.4. The ideas that were evaluated include:

¹¹ www.wsbradio.com/news/news/new-ddi-gwinnett-improving-traffic-delays/ncZ8f

- A western Metro Atlanta “bypass” on new alignment connecting I-75 roughly 30 miles north and south of the current I-285;
- Improved connection from Macon-to-LaGrange plus four-laning the remainder of US 27 north of LaGrange making a west Atlanta “bypass”; and
- A north metro Atlanta “bypass” on new alignment connecting I-75 and I-85 roughly 20-25 miles north of I-285.

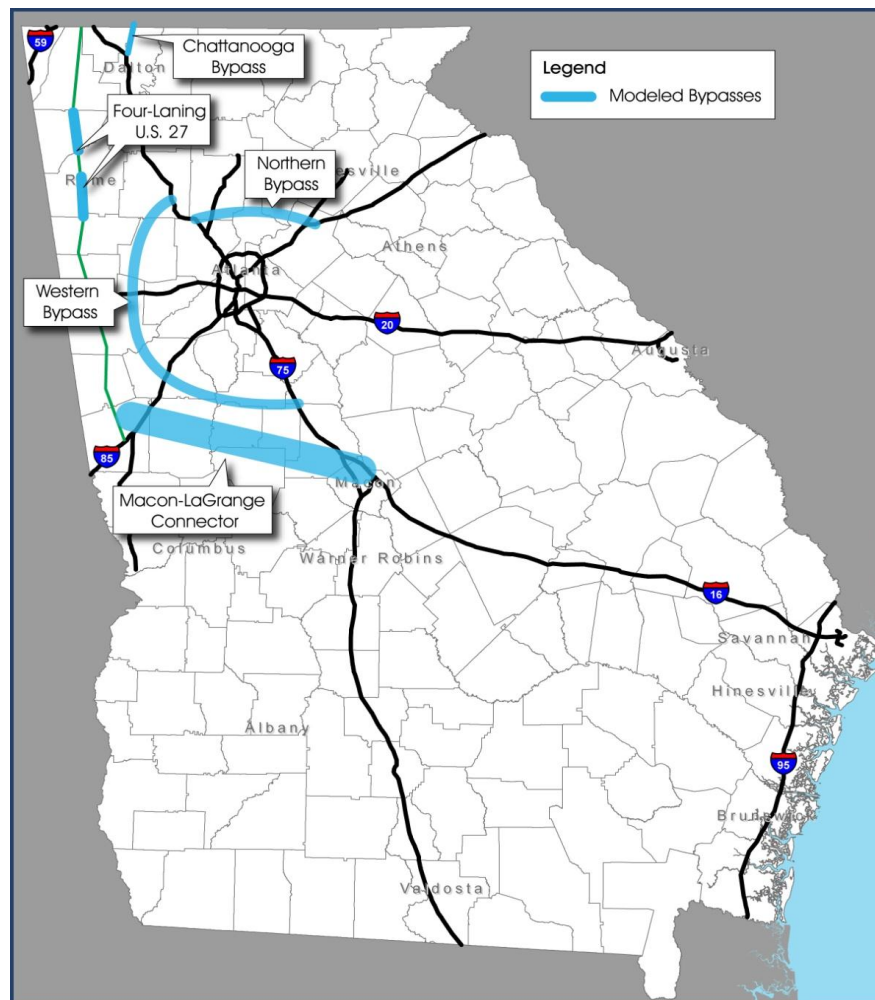
Additionally, it was mentioned by the private sector that if highway bypasses are considered to be feasible, then rail bypasses should also be considered, since the additional right-of-way required may be minimal.

A potential east “bypass” around Chattanooga was also analyzed; its genesis stems from three previous planning efforts: the Tennessee DOT’s I-75 Corridor Feasibility Study¹², the Cleveland, Tennessee MPO’s Long Range Transportation Plan, and the Chattanooga, Tennessee MPO’s Regional Freight Study¹³.

¹² www.tdot.state.tn.us/i75

¹³ www.chcrpa.org/TPO_reorganized/Plans_and_Programs/Multi-Intermodal_Land_Use_and_TransPlanning/Automobile-Freight_Planning/2010_Regional_Freight_Study.htm

Figure 2.4 Alternative “Bypasses” Tested (Using Statewide Travel Demand Model)



Smaller Urban and Rural Freight Corridors

Smaller urban and rural freight corridors are important to the State to ship goods between from lower density population locations to key freight consumption and production locations. They are also important for economic development.

To facilitate economic development the Governor’s Road Improvement Program (“GRIP”) was initiated in 1989 and includes 3,273 miles of roadway, typically outside large urbanized areas¹⁴. The review of the GRIP network and analysis of key corridors that were undertaken as part of this Plan indicated three GRIP corridor improvement projects, still to be completed, that are high-priority freight projects: US 84, State Route 133, and US 441.

¹⁴ www.dot.ga.gov/Projects/programs/Pages/GRIP.aspx

US 84

The first of these GRIP projects is completing the four-laning of US 84. This corridor currently has up to 2,000 trucks per day making it one of the highest truck volume non-interstate corridors in Georgia and serves as the main east-west corridor carrying freight traffic originating at the ports of Brunswick and Savannah.

State Route 133

The second GRIP project is the four-laning of State Route 133 between Albany and I-75 at Valdosta. This route serves many freight-intensive facilities such as the recently-expanded Marine Corps Logistics Base in Albany which employs almost 2,800 civilians and provides worldwide, integrated logistics/supply chain and distribution management including the rebuilding/repair ground of combat and combat support equipment.¹⁵ It is closely aligned with the Marine Corps base at Blount Island in Jacksonville, Florida which is the hub of the Marine Corps' prepositioning programs that provides Marine war fighters with the combat equipment and supplies. In combination, State Route 133, I-75 and I-10 are the main highways used to transport the military equipment to and from the Albany and Blount Island military bases.

Besides military transport, this route carries significant amounts of the non-military goods produced in Albany needing efficient access to I-75 for distribution to the large consumer populations in Florida and the I-10 corridor. Albany manufacturers include Miller-Coors Brewing Company (beer); Proctor & Gamble (Bounty paper towels & Charmin toilet tissue); Coats & Clark (textile-related fibers, yarns, and threads); and SASCO Chemical Company (one of two Georgia companies who won a 2014 "E" Award from the US Department of Commerce – in recognition for contributions to increasing American exports¹⁶.)

On a more regional scale, State Route 133 and the already four-laned road US 82, in combination, serve freight traffic between I-185 (at its southern terminus in Columbus) and I-75 in Valdosta. Because these routes traverse the most agricultural-intensive area of the state, State Route 133 also is a major "farm to market" highway allowing the transport of raw food products to processing plants and finished food products for distribution and retail venues.

Data and analysis from an earlier study supports the data-documented need for improving State Route 133, especially from a truck-focused freight perspective. In December 2009, the GDOT Office of Planning completed its "Southwest Georgia Interstate" accessibility study whose tasks included the development of a sub-regional travel demand model that analyzed current and future travel

¹⁵ www.militaryinstallations.dod.mil

¹⁶ www.commerce.gov/news/press-releases/2014/05/28/us-secretary-commerce-penny-pritzker-honors-65-companies-export-succe

conditions for commuters and trucks. The model included major highway corridors including State Route 133 between Albany and I-75 in Valdosta, and found by the year 2040 that truck vehicle-miles-traveled will be 31.4% of all vehicle-miles-traveled on that corridor -- even if no improvements are made.¹⁷ The model also predicts by 2040 that all routes of the existing road system -- with the exception of one -- will be able to handle anticipated traffic growth and continue to efficiently support highway travel; State Route 133 is the only route expected to experience unacceptable level-of-service for trucks and motorists if it remains a two-lane route as it is today.¹⁸ These findings were supported by attendees at multiple rounds of the study's stakeholder and public meetings, where multiple comments were received supporting the widening of State Route 133. Consequently, one of the study's major investment recommendations was the widening of State Route 133 between Albany and I-75 in Valdosta.

US 441

The third GRIP corridor is four-laning U.S. 441 between I-85 and I-16, which provides alternative access between Central Georgia and I-85 as well as supporting shippers in Central Georgia to connect to markets on the I-85 corridor in the Carolinas/Mid-Atlantic/Northeast.

This corridor also provides the primary route for freight moving between the Port of Savannah and the new Caterpillar assembly plant in Athens, Georgia -- a city through which US 441 passes¹⁹. US 441 also provides an alternative and more direct route for freight moving from the Port of Savannah to new warehouse/distribution and manufacturing businesses clustering along the I-85 corridor in northeast Atlanta metro, such as:

- Carter's (childrenswear) new \$50 million distribution facility which expects 600 full-time employees²⁰,
- 100,000 square foot Whole Foods distribution center expansion²¹,
- PetCo's new 500,000+ square foot distribution center with 217 employees²²,
- Systemax building a \$15 million distribution center with 400 jobs²³,

¹⁷ See Table 4.4.16.1 of study's final report at:
www.dot.ga.gov/Projects/studies/Documents/SWGA/FinalReport-compressed.pdf

¹⁸ See page 76 of Southwest Georgia Interstate study's tech memo at:
www.dot.ga.gov/Projects/studies/Documents/SWGA/FutureConditions/Final%20Future%20Conditions.pdf

¹⁹ <http://onlineathens.com/local-news/2012-02-25/caterpillars-jobs-come-price>

²⁰ gov.georgia.gov/press-releases/2012-04-04/carters-inc-open-multichannel-distribution-center-braselton

²¹ www.gwinnettdaily.com/news/2007/jul/29/whole-foods-to-open-distribution-center-in

²² www.georgia.org/news-room/governor-perdue-announces-distribution-center-coming-to-braselton

²³ www.georgia.org/news-room/systemax-creates-400-jobs-in-jackson-county-georgia

- Bed Bath & Beyond investing \$50 million in a new e-fulfillment center with up to 900 jobs²⁴,
- Ollies' \$14.6 million investment for a new distribution center with 175 jobs²⁵,
- Toyota Industries new \$350 million manufacturing plant with 320 jobs²⁶, and
- Kubota \$73 million production plant with 200 jobs²⁷.

Highway Safety Projects

Analysis was conducted of truck-involved crashes, identifying head-on collisions involving trucks as the most severe vehicle crashes. Most occurred on highways in smaller urban and rural areas with relatively high truck volumes and no median barrier between opposing traffic flows. Improving median barriers at strategic locations is one possible consideration on those freight corridors.

2.4 AIR CARGO PROJECTS

Air cargo projects were identified via stakeholder outreach at Georgia's top three air cargo-handling airports: Hartsfield-Jackson in Atlanta, Southwest Georgia Regional in Albany and Savannah/Hilton Head. Identified air cargo needs included developing additional air cargo warehouse building at Hartsfield-Jackson and lengthening the runway at Southwest Georgia.

²⁴ www.georgia.org/news-room/bed-bath-beyond-inc-to-create-up-to-900-jobs-in-jackson-county

²⁵ www.georgia.org/news-room/deal-ollies-create-approximately-175-jobs-commerce

²⁶ gov.georgia.gov/press-releases/2012-01-31/toyota-industries-creates-320-jobs-jackson-county

²⁷ gov.georgia.gov/press-releases/2011-12-08/kubota-corp-create-200-jobs-jackson-county

3.0 Project Evaluation

A wide range of analysis tools and estimation techniques were utilized to determine the traffic impacts of projects identified for the Freight & Logistics Plan. Table 3.1 lists the tools used for each project category.

Table 3.1 Methodology for Evaluating Individual Projects

Project Category	Methodology or Tool Used to Evaluate Individual Projects
Marine Port Projects	Recent reports
Rail Projects – <i>Crescent Corridor</i>	Previous analysis
Rail Projects – Other improvements	Top-down estimate using previous reports
Highway Projects – Add capacity to long-haul interstates	Georgia DOT statewide travel demand model
Highway Projects – Improve interstate interchanges	“Off-model” analytical technique
Highway Projects – Develop urban “bypasses”	Georgia DOT statewide travel demand model
Highway Projects – Add capacity to rural freight corridors	Georgia DOT statewide travel demand model
Highway Projects – Develop safety projects	“Off-model” analytical technique
Air Cargo Projects	Qualitative descriptions from discussions with airport staff

This chapter is structured to describe the analysis of projects in each of the categories listed in Table 3.1. The sections of this chapter are:

- Section 3.1 – Analysis of Marine Port Projects.
- Section 3.2 – Analysis of Rail Projects.
- Section 3.3. – Highway Projects Analyzed Using State Travel Demand Model.
- Section 3.4 – Highway Projects Analyzed Using Off-Model Techniques.
- Section 3.5 – Analysis of Air Cargo Projects.

3.1 ANALYSIS OF MARINE PORT PROJECTS

Two port-related projects are considered as part of this plan: 1) the Savannah Harbor Expansion Project and 2) Development of the Jasper Ocean Terminal.

Savannah Harbor Expansion Project (Deepening)

The U.S. Army Corp of Engineers recently completed the Savannah Harbor Expansion Project (SHEP) Draft General Re-evaluation Report²⁸ (GRR). The study conducted an extensive analysis of the engineering alternatives, environmental impacts, and economic costs and benefits of deepening the Savannah Harbor and shipping channel. *NOTE: All information regarding SHEP is based on available data as of late 2011.*

As part of the study, the U.S. Army Corps of Engineers created a new analysis model to predict the impact of deepening at various depths, particularly suited for Savannah. To develop this model, input from the Corps' economics experts in navigation at the Institute for Water Resources, plus input from industry experts to evaluate the sophisticated nature of container ship operations were utilized. The Institute for Water Resources and industry experts worked together to identify the aspects of container ship operations that impact vessel loading and operating characteristics. This was used to evaluate vessel operations under each of the proposed channel deepening alternatives being studied. Additionally, the Corps' revised model inputs to estimate the impact of the Panama Canal expansion on the industry's switch to more efficient vessels.

The Draft GRR described that a deeper shipping channel allows larger and fewer ships to move the same amount of goods at a lower transportation cost. Fewer, larger ships also would lessen congestion in the harbor, according to the GRR. A deeper channel means larger ships can enter and leave with less delay waiting for high tides.

At the time this report was first written, the Corps of Engineers calculated that the nation will receive \$71.6 million to \$116 million in annual net benefits depending on the depth. The economic study evaluated benefit years 2015 through 2065. For example, at a 47-foot depth, the construction and environmental mitigation costs are approximately \$570 million with an annual national benefit of \$116 million. For the 48-foot "Maximum Authorized Depth," the construction and environmental mitigation cost estimated at the time this report was originally completed was \$606 million with an annual national benefit of \$115.7 million.

In total, a transportation cost savings of \$2.8 billion was estimated in the Draft GRR. This reduction represents a national economic development (NED) gain because when transportation costs are reduced, those dollars are available for

²⁸ www.sas.usace.army.mil

productive use elsewhere in the economy. Those savings may also be passed on to the consumer through lower prices of the goods purchased.

Jasper Ocean Terminal

Evaluation of the impacts of this project was conducted for “An Update on the Jasper Ocean Terminal” which was developed in March of 2011 by the Georgia Ports Authority and the South Carolina Ports Authority. This report estimated that \$9 billion in tax revenue would accrue to Georgia and South Carolina from the development of Jasper; it was based on the assumption that taxes and jobs scale with port volume. It also assumed that higher container density and efficient operations will lead to increased utilization of existing port facilities.

The report estimates that the Phase 1 construction activities for the new terminal (infrastructure including roads, bridges and utilities) would translate into 900 direct and indirect jobs from the years 2020 to 2025.

As of May 2014, the latest cost estimate to construct the facility on the 1,500 acre site is \$3 billion.²⁹ In addition, Corps of Engineers capacity studies are continuing.

3.2 RAIL-RELATED IMPROVEMENT PROJECTS

The rail-related improvement projects analyzed as part of this plan include one specific project -- Norfolk Southern’s *Crescent Corridor* -- and a generalized set of improvements needed to accommodate future freight rail demand in the state. This section describes how the benefits of each improvement were estimated.

Crescent Corridor

The Crescent Corridor consists of a series of rail tracks that extend as far northeast as New York and New Jersey, though the mid-Atlantic with the southern termini in Memphis and New Orleans (Figure 3.1). According to a presentation that Norfolk Southern made to the Atlanta Regional Commission, the improvements include 300 miles of new passing track and double track by full development, new or expanded terminals in 11 markets, and \$2.5 billion in new investments through full corridor development. The fully developed line will be the nation’s most direct intermodal rail route between the Northeast and the South.

In Georgia, the Crescent Corridor improvements include enhancements to the rail track connecting Atlanta to the South Carolina state border and improvements to the rail track connecting Atlanta to Birmingham parallel to I-20. The Phase 1 improvements in Georgia include line haul capacity improvements

²⁹ www.miamiherald.com/2014/05/22/4131638/savannah-river-can-apparently.html

which would result in increased train speeds in the corridor. The full build-out of the Crescent Corridor would occur in Phases 2 and 3. In Georgia, the full build-out would include improvements to track capacity and railyard enhancements resulting in trains travelling at close to 55 miles per hour. The cost for all the rail improvements in Georgia is estimated to total \$84.3 million.

To estimate the amount of traffic generated by this improved service, two key data sources were utilized. Global Insight TRANSEARCH database was used to determine mode split by commodity. Trucking shipment data was used to define 88 market lanes. This analysis identified that the southeast to northeast market is dominated by truck traffic. Figure 3.2 shows that 15 percent of the long-haul traffic in these trade lanes goes by rail. This is much lower than the rail mode share for other trade lanes.

Improvements to this corridor could allow a higher percentage of the freight in this corridor to shift to rail allowing for significant potential savings in terms of logistics costs, travel time savings, safety improvements, fuel savings, emissions savings, and pavement wear and tear. Based on a Norfolk Southern presentation to the Atlanta Regional Commission in June of 2010, the estimated total monetized public benefits from these improvements were estimated at \$2 billion annually.

The development of new intermodal terminals is also considered to be a significant economic benefit to the region. An economic impact analysis of the Crescent Corridor was conducted for six proposed new terminals and estimated that the cumulative economic impact from 2009 to 2030 was \$40 billion representing a 16:1 return on investment relative to the \$2.5 billion³⁰ in initial investment in the Crescent Corridor. It should be noted that none of the six new terminals included in this analysis were located in Georgia as reflected in Figure 3.1; therefore, the economic benefits for Georgia would be somewhat reduced. However, future expansion at the existing Austell intermodal railyard northwest of Atlanta is included in the overall Crescent Corridor initiative.³¹

³⁰ www.nscorp.com/content/nscorp/en/ship-with-norfolk-southern/shipping-options/corridors/crescent-corridor.html

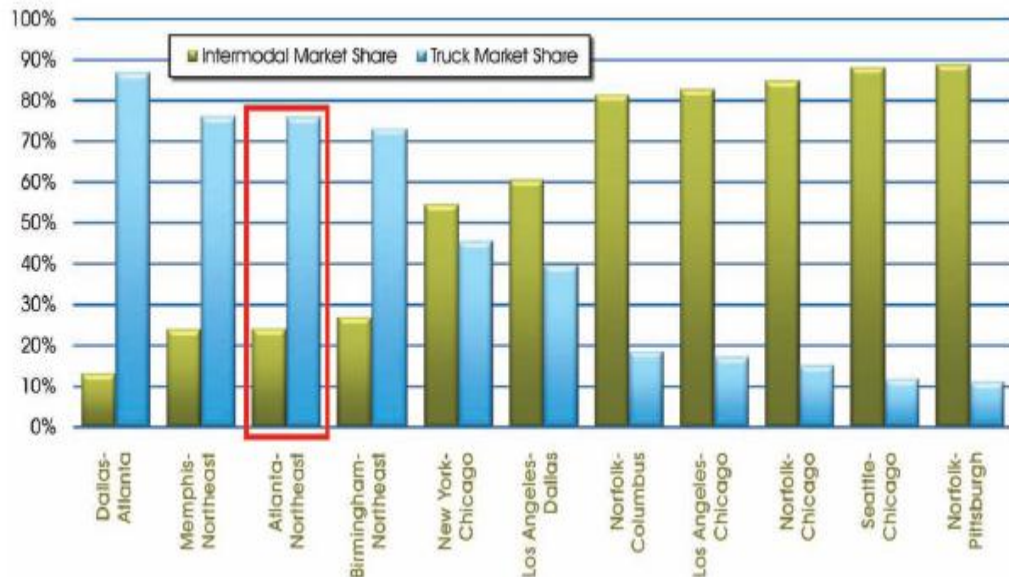
³¹ www.dot.ga.gov/aboutGeorgiadot/Board/Documents/2010Presentations/April/3-GDOT%20CrescentCorridor.pdf

Figure 3.1 Norfolk Southern Crescent Corridor



Source: Norfolk Southern presentation to GDOT Board
www.dot.ga.gov/aboutGeorgiadot/Board/Documents/2010Presentations/April/3-GDOT%20CrescentCorridor.pdf

Figure 3.2 Mode Share for Select Trade Lanes



Source: Norfolk Southern presentation to Atlanta Regional Commission, June 2010

General Rail Improvements Needed in Georgia

As mentioned in Chapter 2, improving general rail deficiencies should be part of a long-term rail program to ensure that future growth in freight movement can be captured by rail. This section will expand on the issues discussed in Chapter 2. As previously noted, specific rail improvement projects out to the 2050 horizon year are outside of the normal planning process for railroads; consequently these projects were not addressed as part of this Plan.

As previously discussed, existing literature developed by the railroads can provide estimates of the benefits of investments in freight rail. The AAR National Rail Freight Infrastructure Capacity and Investment Study (2007) estimated that a national investment of \$148 billion would be needed for freight rail infrastructure expansion between the years 2007 and 2035. As discussed in Chapter 2, prorating these costs to the 2012-to-2050 timeline of the Freight & Logistics Action Plan, and to the state of Georgia, yields an estimate ranging between \$4 - \$6 billion of rail capacity enhancements needed in Georgia.

These costs include the following recommended improvements in the system:

- Line haul expansion;
- Major Bridges, Tunnels, and Vertical Clearance;
- Branch Line Upgrades;
- Intermodal Terminal Expansion; and
- Carload Terminal Expansion.

The methodology used in the AAR study to estimate rail line capacity and investment requirements was as follows:

- Divide the continental U.S. Class I railroad network into primary corridors;
- Establish current corridor volume in freight and passenger trains per day for each primary corridor, based on 2005 Surface Transportation Board Carload Waybill data (the most recent comprehensive information available);
- Estimate current corridor capacity in trains per day for each primary corridor, based on current information;
- Compare current corridor volume to current corridor capacity;
- Estimate future corridor volume in trains per day, using U.S. DOT's Freight Analysis Framework Version 2.2 forecasts of rail freight demand in 2035 by type of commodity and by the origin and destination locations of shipments moving within the U.S. and through international land and port gateways;
- Compare the future corridor volume to current corridor capacity;

- Determine the additional capacity needed to accommodate future train volumes at an acceptable level of service reliability;
- Identify the rail line and signal control system improvements required to provide the additional capacity; and
- Estimate the costs of the improvements.

The AAR study estimated the need for expansion of Class I railroad carload terminals, intermodal yards, and railroad-owned international gateway facilities by analyzing the projected increases in the number of railcars and intermodal units (containers and truck trailers) handled at major facilities and comparing them to current handling capacity. Expansion costs were estimated using unit costs per railcar or intermodal container, or estimated using recent and comparable terminal expansion project costs. Estimates of the cost of expanding service and support facilities such as fueling stations were provided by the railroads based on the anticipated changes in the number and type of trains.

Finally, the AAR study estimated the capacity and investment requirements for secondary mainlines, branch lines, and short line and regional railroads by updating information from a prior study of short line system investment needs commissioned by the American Short Line and Regional Railroad Association.

To estimate the benefits associated with these improvements, the 2003 AASHTO Freight Rail Bottom Line Report was utilized by the Georgia Statewide Freight and Logistics Plan. The report suggests that an additional investment of \$53 billion to upgrade from a constrained investment scenario to a base case scenario yields \$173 billion in reduced highway needs and reduced shipper costs. These benefits can be translated into a return on investment in generalized rail improvements of roughly 3.3.

3.3 HIGHWAY PROJECTS ANALYZED USING THE GEORGIA STATEWIDE TRAVEL DEMAND MODEL

Network Coding

The Georgia statewide travel demand model was used to evaluate projects that added mainline highway capacity. These projects included testing scenarios of adding capacity to long-haul interstate corridors, new limited access urban bypass routes, and improving capacity on smaller urban and rural freight corridors. The definitions of these projects are provided in Chapter 2. The existing and added capacity for each of these projects is shown below in Table 3.2. The map of “bypasses” was previously shown in Figure 2.4.

The full list of GRIP corridors is shown in Figure 3.3. The most freight-intensive corridors from this list were selected based on a combination of truck volumes and feedback from outreach efforts. The specific four-laning enhancements considered as part of this plan were on the following highway segments:

- US 84 between US 1 and US 441;
- State Route 133 between Albany and Valdosta;
- Portions of US 280;
- US 441 between I-16 and I-85; and
- Final section of the Fall Line Freeway (*project now under construction*)

Table 3.2 Capacity-Expansion Projects Tested in the Travel Model

Type	Project Name	Total Number of Through Lanes		
		Existing	Added	Total
Long Haul	I-75 Atlanta-to-Chattanooga	6	2	8
Long Haul	I-75 Atlanta-to-Macon	6	2	8
Long Haul	I-85 Atlanta-to-S.C. Line	4	2	6
Long Haul	I-85 Atlanta-to-AL. Line	4	2	6
Long Haul	I-75 Macon-to-FL. Line	6	2	8
Long Haul	I-16 Macon-to-Savannah	4	2	6
Long Haul	I-20 Atlanta-to-AL. Line	4	2	6
Long Haul	I-20 Atlanta-to-S.C. Line	4	2	6
Long Haul	I-95 (entire stretch)	6	2	8
Smaller Urban and Rural Freight	US 84	2,4	2	4
Smaller Urban and Rural Freight	State Route 133	2	2	4
Smaller Urban and Rural Freight	US 280	2,4	2	4
Smaller Urban and Rural Freight	US 441 from I-16 to I-85	2,4	2	4
Smaller Urban and Rural Freight	Fall Line Freeway (<i>last section now under construction</i>)	2	2	4
Bypass	Western Atlanta metro "Bypass"	0		
Bypass	Macon-to-LaGrange improvement ³² plus remainder of US 27 four-laning north of LaGrange	2,2	0-or-1,2	2-or3,4
Bypass	Chattanooga "Bypass"	0	6	6
Bypass	Northern Atlanta Bypass	0	4	4

Note: As GRIP-designated corridors, only portions of the highways were four-laned.

³² See GDOT's "Connect Central Georgia Study" for detailed improvement projects for the Macon-to-LaGrange connection: www.dot.ga.gov/Projects/studies/Pages/ConnectCentralGeorgia.aspx

Growth Scenarios

The projects were run under two growth scenarios: a medium and a high truck growth scenario. The medium truck growth scenario assumed the truck growth rate to be 2.0 percent annually between 2012 and 2050. This 2.0 percent growth rate is consistent with the TRANSEARCH freight flow forecast utilized in earlier sections of this Plan. Under the medium truck growth scenario, the container growth at the Port of Savannah was capped based on the capacity of its Garden City Terminal.

For the high truck growth scenario, the annual truck growth rates were increased to 4.0 percent. This growth is extremely rapid, but consistent with the growth of Atlanta in the 1980s and 1990s. The unconstrained growth rate for containers at the Port of Savannah was incorporated into the high truck growth scenario. This equates to container growth rate at 4.5 percent per year from 2012 to 2050.

Model Run Features

The relevant output variables from the model were *vehicle miles traveled* (VMT) and *vehicle hours traveled* (VHT) between 2020 (the base year) and 2050 (the horizon year). Changes in VMT and VHT for 2020 and 2050 between build and no build options were used to derive benefits for each of the alternatives. To estimate total changes over the time period of concern, estimates of the changes in VMT and VHT were generated for each year between 2020 and 2050.

The statewide travel demand model forecast years are 2020, 2040, and 2060. To develop 2020 model results, the change in VMT and VHT for 2020 between the no build and build scenarios could be used directly. To develop 2050 traffic impact estimates, the model results for 2040 and 2060 were generated and straight-line interpolation was used such that the midpoint of these two values was used as the estimate for 2050. This was done for both the build and the no build scenarios. The change in VMT and VHT could then be calculated for both 2020 and 2050. Straight-line interpolation was then used to estimate the change in VMT and VHT for years in between 2020 and 2050. All projects were assumed to be open for traffic in 2020 for purposes of this analysis.

The long-haul interstate corridor capacity enhancements were run in the model as a bundle to best identify the system-wide benefits of long-haul capacity improvements. For these model runs, the traffic impacts of the improvements were primarily based on the traffic impacts that occurred on the corridor. Traffic impacts that did not occur on the interstate corridors were allocated to corridors based on their individual improvements of VHT and VMT. The accuracy of this process was confirmed by also running I-85 from Atlanta to South Carolina individually and comparing it to the bundle results. The traffic impact results were similar for both methods.

Each bypass route and smaller urban and rural freight improvement was run as a separate project. The model versions utilized for this analysis were the December 2010 and April 2011 versions. The Statewide Freight & Logistics Plan

was the first GDOT project to utilize the travel demand model for planning purposes. Therefore, ongoing dialogue between the Plan's development team and GDOT modeling staff was utilized to interpret results and ensure realistic outputs were utilized in post-processing analyses.

Travel Demand Model Results

Table 3.3 shows the changes in vehicle miles of travel (VMT) and vehicles hours of travel (VHT) for both autos and trucks in 2050 for the medium growth scenario for each of the capacity enhancement alternatives. Table 3.4 shows the changes in VMT and VHT for the high growth scenario. This table discusses the traffic impact for each of the alternatives, but it cannot be used by itself to evaluate the overall performance of a project.

As expected, the reductions in VMT and VHT were greater for a high growth scenario relative to the medium growth scenario. This is largely due to more delay that can be reduced through the freight improvement projects.

Table 3.3 Results of Changes in VHT and VMT
Medium-Growth Scenario

Improvement Type	Project	Change by Year 2050			
		Auto		Truck	
		VMT	VHT	VMT	VHT
Long Haul	I-75 Atlanta-Chattanooga	138,809	-86,285	58,563	-6,789
Long Haul	I-75 Atlanta-Macon	61,354	-46,779	27,976	-4,915
Long Haul	I-85 Atlanta-SC Line	127,392	-144,707	36,616	-11,134
Long Haul	I-85 Atlanta-AL Line	83,349	-89,444	11,202	-8,776
Long Haul	I-75 Macon-FL Line	122,791	-46,559	43,720	-7,322
Long Haul	I-16 Macon-Savannah	14,143	-5,901	-595	-1,610
Long Haul	I-20 Atlanta-AL Line	99,162	-108,319	16,339	-5,750
Long Haul	I-20 Atlanta-SC Line	140,369	-141,514	22,206	-9,371
Long Haul	I-95 (entire stretch)	174,359	-66,016	42,514	-11,189
Long Haul	All Interstate Long Haul Projects	961,728	-735,523	258,540	-66,857
Smaller Urban and Rural Freight	US 84	-232,014	-8,766	-37,844	-1,704
Smaller Urban and Rural Freight	State Route 133	-494,953	-17,999	-83,416	-3,429
Smaller Urban and Rural Freight	US 280	-158,859	-4,932	-41,269	-1,424
Smaller Urban and Rural Freight	US 441 from I-16 to I-85	-140,784	-12,271	-24,569	-2,344
Smaller Urban and Rural Freight	Fall Line Freeway	55,042	-4,417	27,681	-120

Bypass	Western Bypass	2,317,908	-166,586	267,142	-25,894
Bypass	Macon-to-LaGrange improvement plus remainder of US 27 four-laning north of LaGrange	-950,862	-71,530	-317,624	-14,465
Bypass	I-75 Bypass Around Chattanooga	-443,894	-25,708	-62,488	-3,806
Bypass	Northern Bypass	1,917,686	-362,302	45,506	-11,855

Table 3.4 Results of Changes in VHT and VMT
High-Growth Scenario

Type	Project	Change by Year 2050			
		Auto		Truck	
		VMT	VHT	VMT	VHT
Long Haul	I-75 Atlanta-Chattanooga	116,314	-55,122	311,383	-10,316
Long Haul	I-75 Atlanta-Macon	53,404	-35,970	208,170	-10,316
Long Haul	I-85 Atlanta-SC Line	124,972	-158,939	159,777	-43,880
Long Haul	I-85 Atlanta-AL Line	82,661	-98,067	108,695	-27,928
Long Haul	I-75 Macon-FL Line	122,396	-42,940	367,355	-14,695
Long Haul	I-16 Macon-Savannah	56,716	-18,312	133,671	-27,841
Long Haul	I-20 Atlanta-AL Line	106,704	-100,828	64,154	-21,463
Long Haul	I-20 Atlanta-SC Line	113,921	-179,602	148,519	-28,649
Long Haul	I-95 (entire stretch)	73,910	-106,015	143,125	-66,188
Long Haul	All Interstate Long Haul Projects	850,997	-795,795	1,644,849	-251,275
Smaller Urban and Rural Freight	US 84	454,274	-13,382	194,823	-6,054
Smaller Urban and Rural Freight	State Route 133	156,906	-27,477	377,828	-12,181
Smaller Urban and Rural Freight	US 280	95,751	-7,529	412,498	-5,060
Smaller Urban and Rural Freight	US 441 from I-16 to I-85	361,939	-18,732	255,090	-8,326
Smaller Urban and Rural Freight	Fall Line Freeway	554,749	-104,656	368,918	-348
Bypass	Western Bypass	2,051,030	-180,237	1,699,576	-97,319
Bypass	Macon-to-LaGrange improvement plus remainder of the US 27 four-laning north of LaGrange	-724,081	-109,197	-907,286	-51,389
Bypass	I-75 "Bypass" Around Chattanooga	-345,474	-30,561	-227,556	-18,919
Bypass	Northern Bypass	1,711,610	-433,260	204,014	-24,635

Estimation of User Benefits

The first step in developing benefit-cost ratios is generating an estimate of the benefits from implementing each project. Factors considered for benefit calculations is a reduction in several cost factors associated with owning and operating a vehicle. These cost factors are:

- Travel time costs;
- Travel time reliability costs;
- Safety costs;
- Vehicle operating costs;
- Emissions costs; and
- Pavement damage costs.

Travel Time Costs

Travel time savings is the monetized benefit of less time spent traveling on the roads. Travel time savings is calculated for three trip types: trucks, business travel and commuter travel. The calculation of travel time savings is based on estimating the opportunity cost to the road-user of an alternative use of time. Opportunity cost is a function of trip purpose, wage rates, and amount of time saved.

Reduction in daily freight transportation cost is valued as the product of freight transportation cost per hour and the daily change in travel time or delay. Transportation cost per hour of \$58.57 is utilized for truck travel for this study³³.

For personal auto travel, travel time savings is valued as the product of hourly wages and changes in VHT. Average wage rate for Georgia reported by the Bureau of Labor Statistics (BLS) is employed for this analysis.

For business related auto travels, annual value of travel time savings is equivalent to value of daily travel time saving annualized over 260 working days. Daily value of travel time savings is estimated as the product of traveler's hourly wage and daily travel time savings. Average hourly wage of \$49.15 associated with management level positions in Georgia, as reported by the Bureau of Labor Statistics (BLS) is utilized for this analysis.

$$\Delta V_t^{Business} = W_t^{Business} \times \Delta VHT_t^{Business} \times 260$$

Where,

ΔVHT_t = Change in daily travel time

³³Levinson et al (2005), Value of Time for Commercial Vehicle Operators in Minnesota.

$W_t^{Business}$ = Average wage rate in Georgia, reported by the Bureau of Labor Statistics

$\Delta V_t^{Business}$ = Annual monetized value of business related travel time savings

For commuters, the value of travel time savings is computed similar to the method used for estimating benefits for business travelers. The only difference stems from the application of wage rate. For commuters, statewide average hourly wage of \$10.23, reported by the Bureau of Labor Statistics is used.

$\Delta V_t^{Commute} = W_t^{Commute} \times \Delta VHT_t^{Commute} \times 260$

Where,

$\Delta V_t^{Commute}$ = Monetized value of commute related travel time savings

$W_t^{Commute}$ = Average hourly wage in Georgia (from Bureau of Labor Statistics)

$\Delta VHT_t^{Commute}$ = Daily change in commute related vehicle-hours traveled

Travel Time Reliability Costs

Travel time reliability is used to represent the amount of variability in travel times in the highway system. The Georgia Regional Transportation Authority's 2010 Metro Atlanta Performance Measures report was used to generate travel time reliability savings. Estimates of the non-recurrent incident rate at 30 percent and average buffer time index of 32 percent for the Atlanta metropolitan region; this generated travel time reliability of 9.6 percent of travel time.³⁴

Safety Costs

Frequency of accidents and value of accidents are the two factors used to estimate safety costs. Reductions in overall crash rates and crash severity result in savings to industries and households. Savings in the loss or disability of workers, damage to property, and insurance rates are some ways in which crash reductions are expected to lower the overall costs of doing business of the region's firms and increase the disposable income for commuters.

For trucks, changes in safety costs between each build alternative are calculated using the estimated changes in VMT, accident rates and dollar values of accidents. Value of accidents reported by the Georgia Department of Transportation (GDOT) and analysis of 2005-2008 crash data reported provided accident rates utilized for this analysis (Table 3.5).

³⁴ www.grta.org/tran_map/2010_Transportation_MAP_Report.pdf

Table 3.5 Value of Accident and Accidents Rates by Severity

Accident by Severity	Value (\$)	Accident Rate Per Million VMT	
		Auto	Truck
Fatal	5,800,000	0.012	0.031
Injury	333,500	0.688	0.628
Property Damage	4,400	1.915	1.908

Source: GDOT 2005-2008 Crash Data, Project Team analysis.

Estimation of safety costs for personal travel is similar to that used for freight transportation. For personal vehicles, benefit annualization varies by trip purpose: business and commute related personal travels are annualized over 260 working days, while nonwork related is annualized over 365 days.

Vehicle Operating Costs

Changes in vehicle operating costs (VOC) are estimated as a product of fixed cost per mile and changes in vehicle-miles traveled. Change in vehicle operating costs is estimated separately for fuel and non-fuel and summed (Table 3.6).

Due to unpredictable gas prices, many benefit estimation models leave the fuel price constant in forecast years. This analysis follows the same practice and allowed future price to be set at the current average economic price of \$4 and projecting growth with the Bureau of Labor Statistics' Consumer Price Index.

Non-fuel VOC comprises the wearing-out of expendable items on the vehicle. A constant wear-out rate is a reasonable assumption given data limitations and the unpredictability of future wear-out rates. In view of this, a per mile cost on non-fuel operating costs for both truck and personal vehicle from Barnes and Langworthy (2003), updated to 2011 dollars are employed for this analysis.

Table 3.6 Vehicle Operating Costs Inputs

Vehicle Type	Fuel Cost Per Gallon (\$) ³⁵	Fuel Consumption Per Mile	Non-fuel Cost Per Mile ³⁶
Auto	4	19.12 ³⁷	0.15
Truck	4	6.5 ³⁸	0.30

Source: US Environmental Protection Agency, Barnes and Langworthy (2003), Cambridge Systematics analysis.

³⁵ Average market price less Federal and State taxes.

³⁶ Barnes and Langworthy (2003), updated to 2011 dollars.

³⁷ "Emission Facts: Average Annual Emissions and Fuel Consumption Cars and Light Trucks." EPA420-F-00-013, April 2000 (Average data for passenger cars and auto are used for the analysis.)

³⁸ Barnes and Langworthy (2003). [Used midpoint of 5.8 to 7.2 mpg for the analysis.]

Change in the fuel component of vehicle-operating cost for truck travel is expressed below:

$$\Delta VOC_t^{fuel} = FC \times FE^{Truck} \times \Delta VMT_t^{Truck} \times 365$$

Where:

ΔVOC_t^{fuel} = Change in annual fuel cost component of vehicle-operating costs

FC = Fuel cost per gallon (less taxes/subsidies)

FE = Fuel consumption per mile

ΔVMT_t = Daily change in vehicle-miles traveled

Annual change in non-fuel costs of freight transportation is estimated as:

$$\Delta VOC_t^{Non-fuel} = NFC \times \Delta VMT_t^{Truck} \times 365$$

Where NFC = non-fuel cost per mile for trucks

Thus, total change in vehicle-operating costs for freight transportation can be expressed as:

$$\Delta VOC_t^{TR} = \Delta VOC_t^{Fuel} + \Delta VOC_t^{Non-fuel}$$

For person auto operating costs, assuming 260 working days a year, fuel and non-fuel vehicle-operating costs for yearly-passenger travel (auto) can be expressed as follows:

$$\Delta VOC_t^{fuel} = FC \times FE \times \Delta VMT_t^{Auto} \times 260$$

$$\Delta VOC_t^{Non-fuel} = NFC \times \Delta VMT_t^{Auto} \times 260$$

Hence, annual changes in vehicle-operating costs were expressed as follows:

$$\Delta VOC_t^{Auto} = \Delta VOC_t^{fuel} + \Delta VOC_t^{Non-fuel}$$

Emissions Costs

Air pollutant emissions include carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compounds (VOC), particulate matters (PM), and oxides of Sulfur (SOx). These emissions react with other pollutants in the atmosphere, especially NOx and VOC, to form Ozone. VOC, SOx, and NOx, also react to form particulates. These pollutants cause damage to human health and can damage property as well. Some of the mobile source pollutants of concern are diesel particulate matter (PM) and volatile organic compounds (VOCs).

For truck emission savings, change in emissions costs is estimated as the product of emission cost per mile and change in vehicle-miles traveled. Emission cost per mile is the sum of per-miles costs of individual pollutants. Per-mile cost of individual pollutants can be estimated as cost per emission type multiplied by emission per mile (Table 3.7).

Table 3.7 Emission Cost Inputs

Emission Type	Cost By Emission Type (\$/ton) ³⁹	Grams of Emissions Per Mile ⁴⁰	
		Auto	Truck
NOx	3	0.911	0.0036
Sox	16,000	0.0077	0.022
PM	16,800	0.0179	0.41
CO ₂	21.4 ⁴¹	411.1	1345.4
VOC	1,700	0.23	0.23

Source: Tiger III from U.S. DOT, MOVES Model Inputs, Executive Order 12866.

The emission costs are computed for freight transportation and total personal travel separately and then summed together. The equations that govern these calculations are:

$$\Delta EC_t = \Delta VMT_t^{TR} \times \sum_{i=1}^n (EC_i \times EP_i) \times 365$$

Where

ΔEC_t = Annual change in emission cost per mile

ΔVMT_t^{TR} = Change in vehicle-miles between build and no-build scenarios

EC = Emission cost of emission type

EP = Emission per mile

For personal auto travel, the emission costs is

$$\Delta EC_t = \Delta VMT_t^{Auto} \times \sum_{i=1}^n (EC_i \times EP_i) \times D$$

Where,

ΔVMT_t^{TR} = Change in vehicle-miles between build and no-build scenarios

D = number of working days: commute and business trips (260 days) and nonwork trips (365 days)

Pavement Damage Costs

Pavement damage is proportional to the weight of wheel axles that utilize the roadway. Therefore, trucks cause much more pavement damage per mile than autos. The Federal Highway Administration's Highway Cost Allocation Study

³⁹ Costs of pollutants from US DOT Tiger III Cost Standards. www.dot.gov/tiger/application-resources.html#BCAG

⁴⁰ Source of emission factors from MOVES Model standard factors for the US, retained by Cambridge Systematics.

⁴¹ Cost of CO₂ is from social cost of carbon for regulatory impact analysis under Executive Order 12866: www.epa.gov/OMS/climate/regulations/scc-tds.pdf

estimates a pavement maintenance price of \$0.01 per automobile VMT, and \$0.031 per 40,000 pound truck VMT.⁴²

Construction and Operations & Maintenance Costs

The cost to develop a roadway includes capital and operation and maintenance costs. The relevant costs for this Plan are construction costs and incremental operation and maintenance costs. All projects are assumed to have a five-year construction period (2015-2019) and operation commencement in 2020, and 30-year life span such that there is no residual value of the asset by 2050.

Table 3.8 provides development costs for all of the capacity enhancement highway projects.

Table 3.8 Construction and Operation and Maintenance Cost by Projects
Millions of 2011 Dollars

Type	Project	Capital Cost	Annual OM Cost	Total OM Cost	Total Project Cost
Long Haul	I-75 Atlanta-Chattanooga	\$ 2,700	\$ 19	\$ 570	\$ 3,270
Long Haul	I-75 Atlanta-Macon	\$ 1,086	\$ 17	\$ 510	\$ 1,596
Long Haul	I-85 Atlanta-SC Line	\$ 1,157	\$ 15	\$ 450	\$ 1,607
Long Haul	I-85 Atlanta-AL Line	\$ 1,177	\$ 13	\$ 390	\$ 1,567
Long Haul	I-75 Macon-FL Line	\$ 1,000	\$ 28	\$ 840	\$ 1,840
Long Haul	I-16 Macon-Savannah	\$ 1,900	\$ 54	\$ 1,620	\$ 3,520
Long Haul	I-20 Atlanta-AL Line	\$ 800	\$ 10	\$ 300	\$ 1,100
Long Haul	I-20 Atlanta-SC Line	\$ 2,945	\$ 23	\$ 690	\$ 3,635
Long Haul	I-95 (entire stretch)	\$ 1,620	\$ 18	\$ 540	\$ 2,160
Long Haul	All Interstate "Long Haul"	\$ 14,385	\$ 211	\$ 6,330	\$ 20,715
Smaller Urban and Rural Freight	US 84	\$ 55	\$ 2	\$ 60	\$ 115
Smaller Urban and Rural Freight	State Route 133	\$ 278	\$ 10	\$ 300	\$ 578
Smaller Urban and Rural Freight	US 280	\$ 996	\$ 16	\$ 480	\$ 1,476
Smaller Urban and Rural Freight	US 441 from I-16 to I-85	\$ 189	\$ 4	\$ 120	\$ 309
Smaller Urban and Rural Frt.	Fall Line Freeway	(project now under construction)			

⁴² www.fhwa.dot.gov/policy/otps/costallocation.htm.

Type	Project	Capital Cost	Annual OM Cost	Total OM Cost	Total Project Cost
"Bypass"	Western "Bypass"	\$ 3,135	\$ 35	\$ 1,050	\$ 4,185
"Bypass"	Macon-to-LaGrange improvement plus remainder of the US 27 four-laning north of LaGrange	\$ 483	\$ 12	\$ 360	\$ 843
"Bypass"	I-75 Bypass Around Chattanooga	\$ 800	\$ 13	\$ 390	\$ 1,190
"Bypass"	Northern Bypass	\$ 2,663	\$ 13	\$ 390	\$ 3,053

Source: GDOT TPRO, GDOT Costing Tool, GDOT GRIP Program Factsheets.

Discount Rate

Discount rate measures the cost of a dollar in the future relative to a dollar available in the current time. The opportunity cost is valued at 2.9 percent for this Plan. The annual benefit and costs associated with the projects are discounted at 2.9 percent to present 2011 dollars.

Benefit-Costs Analysis

Since VHT and VMT values are available for the years 2020 and 2050, benefits are determined for these two years separately, the benefits for intermediate years are then determined using linear interpolation. The benefits for the 30 years are then accrued by determining the net present value (NPV) for year 2020. The formula to generate this value is provided in the following information.

$$NPV = P \left(\frac{1 - (1 + r)^{-(n-1)}}{r} \right)$$

Where P = benefit of year 2020, r = discount rate (2.9%), and n = number of years between 2020 and 2050 (30 years)

The NPV generated will be in 2020 dollar terms, and therefore need to be brought back to 2011, or real present value terms, using this formula:

$$NPV_{2011} = NPV_{2020} \left(\frac{1}{(1 + r)^{n-1}} \right)$$

Where r = discount rate (2.9%) and n = # of years between 2011-2020 (9 years)

A ratio of the present value of benefits to the present value of costs is the benefit-cost ratio (BCR). The BCR can be calculated by dividing the NPV with total project cost for each project. Table 3.9 shows the results of the BCA calculation for the medium truck scenario and Table 3.10 shows the results for the high truck scenario.

Note: B/C ratios for alternatives are negative due to the increased vehicle operating costs outweighing the congestion and safety benefits for the added roadway segment.

Table 3.9 B/C Analysis for Capacity Expansion Projects
Medium-Growth Scenario

Type	Project	Benefit (2011) – Millions	Capital Cost – Millions	Total OM Cost – Millions	B/C
Long Haul	I-85 Atlanta-SC Line	\$ 2,913	\$ 1,157	\$ 457	2.12
Long Haul	I-20 Atlanta-AL Line	\$ 1,651	\$ 800	\$ 287	1.71
Long Haul	I-85 Atlanta-AL Line	\$ 2,060	\$ 1,177	\$ 382	1.43
Long Haul	I-75 Atlanta-Macon	\$ 1,977	\$ 1,086	\$ 508	1.35
Long Haul	I-20 Atlanta-SC Line	\$ 3,305	\$ 2,945	\$ 685	0.89
Long Haul	I-95 (entire stretch)	\$ 1,779	\$ 1,620	\$ 536	0.77
Long Haul	I-75 Macon-FL Line	\$ 1,174	\$ 1,000	\$ 833	0.34
Long Haul	I-75 Atlanta-Chattanooga	\$ 1,409	\$ 2,700	\$ 555	0.32
Long Haul	I-16 Macon-Savannah	\$ 978	\$ 1,900	\$ 1,619	-0.33
Smaller Urban & Rural Freight	US 84	\$ 657	\$ 55	\$ 66	10.75
Smaller Urban & Rural Freight	State Route 133	\$ 1,648	\$ 278	\$ 289	4.89
Smaller Urban & Rural Freight	US 441 from I-16 to I-85	\$ 537	\$ 189	\$ 134	2.13
Smaller Urban & Rural Freight	US 280	\$ 19	\$ 996	\$ 489	-0.47
Smaller Urban & Rural Freight	Fall Line Freeway	(project now under construction)			
Bypass	Macon-to-LaGrange improvement plus remainder of US 27 four-laning	\$ 4,459	\$ 483	\$ 361	8.48
Bypass	I-75 Bypass Around Chattanooga	\$ 3,506	\$ 800	\$ 394	3.89
Bypass	Northern Bypass	\$ 2,821	\$ 2,663	\$ 385	0.91
Bypass	Western Bypass	\$ 2,897	\$ 3,135	\$ 1,057	0.59

Table 3.10 B/C Analysis for Capacity Expansion Projects
High Growth Scenario

Type	Project	Benefit (2011) – Millions	Capital Cost – Millions	Total OM Cost – Millions	B/C
Long Haul	I-85 Atlanta-SC Line	\$12,011	\$1,157	\$457	9.99
Long Haul	I-20 Atlanta-AL Line	\$5,166	\$800	\$287	6.1
Long Haul	I-85 Atlanta-AL Line	\$6,599	\$1,177	\$382	5.28
Long Haul	I-75 Atlanta-Macon	\$1,998	\$1,086	\$508	1.37
Long Haul	I-20 Atlanta-SC Line	\$6,915	\$2,945	\$685	2.12
Long Haul	I-95 (entire stretch)	\$16,955	\$1,620	\$536	10.14
Long Haul	I-75 Macon-FL Line	\$3,690	\$1,000	\$833	2.86
Long Haul	I-75 Atlanta-Chattanooga	\$3,234	\$2,700	\$555	0.99
Long Haul	I-16 Macon-Savannah	\$4,569	\$1,900	\$1,619	1.55
Smaller Urban & Rural Freight	US 84	(\$726)	\$55	\$66	-14.4
Smaller Urban & Rural Freight	State Route 133	(\$248)	\$278	\$289	-1.93
Smaller Urban & Rural Freight	US 441 from I-16 to I-85	(\$742)	\$189	\$134	-4.63
Smaller Urban & Rural Freight	US 280	\$98	\$996	\$489	-0.39
Smaller Urban & Rural Freight	Fall Line Freeway	(project now under construction)			
Bypass	Macon-to-LaGrange improvement plus remainder of US 27 four-laning north of LaGrange	\$12,879	\$483	\$361	25.92
Bypass	I-75 Bypass Around Chattanooga	\$8,863	\$800	\$394	10.59
Bypass	Northern Bypass	\$6,288	\$2,663	\$385	2.22
Bypass	Western Bypass	\$10,283	\$3,135	\$1,057	2.94

3.4 HIGHWAY PROJECTS ANALYZED USING OFF-MODEL ANALYSIS

This section discusses the projects that could not be analyzed using the statewide travel demand model. A range of off-model techniques was used to estimate the traffic impacts of these projects. Benefits were then calculated for these alternatives using the same methodology as for the projects that were modeled. Highway projects that were analyzed using off-model techniques were interstate interchange improvement projects, a truck-friendly lane alternative on State Route 6 in Atlanta, and safety-related projects.

Interchange Improvements

Select interchange improvements were analyzed using off-model techniques that expanded upon existing data and previous interstate interchange analysis. For each interstate interchange analyzed, current congestion levels were estimated based on current truck and auto volumes combined with vehicle speed data provided in the ATRI Freight Performance Measurement database. The amount of delay reduction at each interchange was estimated based on a sample of previous simulation runs conducted at similar interstate interchanges.

The changes in delay under build and no build conditions were used to generate benefits in a similar fashion as for the modeled projects. The benefits were then combined with estimated costs to determine B/C ratios for each project.

Table 3.11 B/C Analysis Results of Select Interchange Improvement Projects

Project	2020 Change		2050 Change		Benefit (2011) – Millions	Capital Cost – Millions	Total OM Cost – Millions	B/C
	Auto VHT	Truck VHT	Auto VHT	Truck VHT				
Atlanta, GA: I-285 at I-85 (North metro)	-11,988	-2,396	-29,098	-5,815	\$1,955	\$200	\$120	9.18
Atlanta, GA: I-75 at I-285 (North metro)	-8,016	-1,774	-19,457	-4,306	\$1,411	\$200	\$120	6.46
Atlanta, GA: I-20 at I-285 (West metro)	-4,015	-1,331	-9,746	-3,230	\$ 974	\$382	\$229	1.95
Atlanta, GA: I-20 at I-285 (East metro)	-3,890	-840	-9,441	-2,040	\$672	\$109	\$65	5.57
Macon, GA: I-16 at I-75		See	footnote					7.58 ⁴³
Savannah, GA: I-95 at I-16	-154	-53	-373	-129	\$ 39	\$73	\$44	-0.07
Atlanta, GA: I-285 at I-85 (South metro)	-1,106	-364	-2,685	-884	\$ 267	\$240	\$144	0.51
Atlanta, GA: I-75 at I-285 (South metro)	-1,756	-493	-4,262	-1,196	\$ 372	\$240	\$144	0.95
Savannah, GA: I-95 at State Route 21	-128	-47	-310	-113	\$ 34	\$ 73	\$ 44	-0.14

State Route 6 “Truck-Friendly” Lanes

Roadway access to and from intermodal rail yards is critical to ensure reliability of goods movements for the supply chain. In the Atlanta region, most intermodal yards are closely located to interstates, and therefore interstate improvement solutions can help address access issues to/from these intermodal yards. One

⁴³ GDOT TIGER 2011 funding application submitted to US DOT

exception is Norfolk Sothern's Whitaker Yard intermodal terminal near Austell, which connects to I-20 using State Route 6. Because this intermodal terminal receives up to 1,000 trucks per day in peak season⁴⁴, this highway experiences high truck volumes mixed with significant volumes of auto traffic from commuters to/from the suburban city of Austell. This corridor has already been officially designated by US DOT as an Intermodal Connector.

A freight-focused project has been identified to improve traffic operations on State Route 6. More specifically, the project is known as the State Route 6 "Truck Friendly" truck lanes which propose these elements to support truck movements⁴⁵:

- Widen existing shoulders to accommodate a 3rd "Truck Friendly" Lane;
- Maintain existing bridge widths;
- Improvements to key intersections ;
- Reduce truck stops and eliminate dilemma zones⁴⁶;
- ITS Integration with Intermodal Facility (travel times);
- Increase overhead signage along the corridor; and
- Identify rollover crashes exiting facility onto State Route 6/US 278.

These listed benefits do not easily lend themselves to quantification using a benefit-cost ratio. However, based on the current and future unacceptable level of service for traffic conditions on State Route 6, and the presence of Georgia's busiest intermodal yard⁴⁷ immediately adjacent to the route (which is planned to expand as part of the Crescent Corridor⁴⁸), the improvement of State Route 6 is a significant recommended freight improvement project.

Highway Safety Improvements

Across the median crashes are generally high in severity and can easily occur on long stretches of highways where there are minimal physical barriers between the two directions of travel. In such cases, installation of median barriers may be one safety improvement to consider in support of crash severity reduction.

⁴⁴ http://comdev.cobbcountyga.gov/documents/SR6_Final-Rpt_1-8-08.pdf

⁴⁵ www.atlantaregional.com/File%20Library/Transportation/Freight/tp_freight_sr6trucklanes_041411.pdf

⁴⁶ <http://safety.fhwa.dot.gov/intersection/resources/techsum/fhwas09008>

⁴⁷ See Table 3.1 of Georgia Statewide Freight & Logistics Plan's *Rail Modal Profile* document at: www.dot.ga.gov/Projects/programs/georgiafreight/logisticsplan/Documents/Plan/RailModal-Task3.pdf

⁴⁸ www.dot.ga.gov/aboutGeorgiadot/Board/Documents/2010Presentations/April/3-GDOT%20CrescentCorridor.pdf

To quantify the benefit of improving median barriers, the methodology outlined in *Median Treatment Study on Washington State Highways* is used.⁴⁹ The benefit of the median barrier will be the reduced societal costs of crashes. Safety values from GDOT are used to quantify the cost of crashes by severity category.

The savings in cost is calculated by assuming that the severity of post-installation crashes will be reduced from fatal to injury crashes. While the WSDOT study breaks down cost by different injury categories, for our purposes only one injury and fatality cost is used. This means that savings from several injury to light injury costs are not accounted for, and that our estimate of safety savings is likely to be a conservative one.

The next step is to determine the number of crashes that run across the roadway. For this, the GDOT crash database years from 2005 to 2008 are used, and crashes under first harmful event of “colliding with motor vehicle in motion in other roadway” are counted. It is found that there are 1,334 property-damage-only crashes, 618 injury crashes, and 27 fatal crashes. Of the 618 injury crashes, there are 35 severe injury crashes and 583 injury crashes. Safety savings were calculated from the 27 fatal crashes; the annual benefit resulting from the reduced crash costs is \$35,898,875.

The average cost of installing and maintaining each of the three median barrier types is shown in Table 3.12.

Table 3.12 Costs for Median Barrier Improvements (source: GDOT)

Type of Barrier	Construction Costs (Per Mile)	Annual Maintenance Costs (\$/per Mile)
Cable Barrier	73,920	1,880
Guardrail	79,200	270
Concrete Barrier	1,056,000	43

The next step is to identify the highway sections where installing the barriers will have the most significant impact. GDOT’s 2009 Roadway Classification file is used to act as a general guide to determine the mileage of highways. The criteria used (adopted from *Median Treatment Study on Washington State Highways*) to determine sections of highway that are recommended to install barriers:

- AADT > 5,000 vehicles
- Median width < 50 ft.
- Speed limit > 45 mph
- Roadways with no median or with only curb median

⁴⁹ www.wsdot.wa.gov/research/reports/fullreports/516.1.pdf

This generated 2,740 miles of roadway in Georgia. Note that this value is a general estimation since the RC file has missing data, and the criteria used are approximate...field verification should be conducted to determine sections of highways eligible for barrier installation, in the event that a more detailed B/C analysis is to be performed (using this formula from the WSDOT study):

$$BC \text{ Ratio} = \frac{(Benefits * 13.59)[present \text{ worth factor}]}{cost_I + cost_M * 13.59 [present \text{ worth factor}]}$$

Table 3.13 B/C Estimation for Median Barrier Installation (source: GDOT)

	Average Construction Costs (\$/per mile)	Annual Maintenance Costs (\$/per mile)	Construction Cost (\$ millions)	Maintenance Cost (\$ millions)	B/C
Cable Barrier	73,920	2,371	202	6.5	1.72
Guardrail	79,200	340	217	0.9	2.18
Concrete Barrier	1,056,000	54	2,893	0.1	0.17

3.5 AIR CARGO RELATED IMPROVEMENTS

Add Warehouse Capacity at Hartsfield-Jackson Atlanta Airport

To accommodate future air cargo growth, the Atlanta airport has identified the need for more warehouse space which would allow for additional short-term storage of goods between flight arrivals/departures and truck arrivals/departures. As air cargo volumes continue to increase, more of these types of facilities will be needed. The cost was estimated at \$10-\$15 million based on discussions with airport staff.

Extend Southwest Georgia (Albany) Airport Runway

Recommended in the 2010 Southwest Georgia Airport Masterplan, the estimated cost for the runway extension is almost \$5 million. The benefits cannot be easily quantified until changes in air cargo volumes materialize at this airport. However, extending the runway can improve current operations and serve as a business retention/recruitment vehicle for southwest Georgia.

4.0 Freight “Packages”

The previous chapter described the analysis of several projects using the statewide model and off-model techniques. This chapter identifies which of those projects will become priority freight projects based on this analysis along with feedback from our stakeholder group and technical analysis conducted for the modal profiles.

After identifying priority freight projects, the projects are grouped into packages to develop sets of projects that are complementary and will benefit key truck flow patterns in the state.

4.1 IDENTIFYING PRIORITY FREIGHT PROJECTS

Table 4.1 provides a list of the alternatives analyzed in this Plan along with whether or not the project became a priority freight project and the rationale for its designation. Projects that are marked as priority are then grouped into modal and geographic packages in the next section. These packages were analyzed for benefit/cost, but to give light of their priority, the summary of qualitative considerations were referenced in the comments column in Table 4.1. Benefit/cost is important but needs to be taken into context; according to US DOT, there should be some mindfulness about cost-benefit results:

“Cost-benefit analysis is a framework for considering a range of benefits and costs in monetary terms. A variety of analytical tools are available to assist in quantifying and monetizing the various benefits and impacts of transportation and land development policies. Since some impacts are difficult to monetize, the results of cost-benefit analysis are rarely the sole factor in determining whether a project or policy is worthwhile.”⁵⁰

Table 4.1 Identification of Select Priority Freight Projects

Project Category	Location/Project	B/C Ratio (or other benefit)	Immediate Priority?	Comments
Port	Savannah Harbor Expansion Project	5.5 ⁵¹ (\$2.8 billion in trans. cost savings)	Y	High B/C and return-on-investment. High priority from stakeholder input

⁵⁰ www.fhwa.dot.gov/planning/processes/tools/toolbox/methodologies/costbenefit_overview.cfm

⁵¹ www.gaports.com/Portals/2/More/GPA281-SHEP-Single-CMYK.pdf

Project Category	Location/Project	B/C Ratio (or other benefit)	Immediate Priority?	Comments
Port	Savannah: Develop the Jasper Ocean Terminal	\$9 billion in tax receipts	N	High return on investment; needed in longer-term to maintain growth momentum. Bi-state development/coordination ongoing.
Rail	Statewide: Systemwide rail improvements	3.30	Y	High Freight B/C ratio. Need to accommodate future rail growth
Highway – Long Haul	I-85 Atlanta-to-S.C. widening	1.81	Y	High Freight B/C ratio. High truck volumes.
Highway – Long Haul	I-20 Atlanta-to-AL. widening	1.52	Y	High Freight B/C ratio. High truck volumes. Matches Alabama DOT's I-20 widen to the state line recently let to construction. ⁵²
Highway – Long Haul	I-85 Atlanta-to-AL. widening	1.32	Y	High Freight B/C ratio. High truck volumes
Highway – Long Haul	I-75 Atlanta-to-Macon widening	1.24	Y	High Freight B/C ratio. High truck volumes
Highway – Long Haul	I-20 Atlanta-to-S.C. widening	0.91	N	Modest B/C ratio. Existing capacity sufficient over the long-term
Highway – Long Haul	I-95 (entire state) widening	0.83	N	Modest B/C ratio. Existing capacity sufficient over the long-term
Highway – Long Haul	I-75 Macon-to-FL. widening	0.64	N	Modest B/C ratio. Existing capacity sufficient over the long-term
Highway – Long Haul	I-75 Atlanta-to-TN. widening	0.43	N	Low B/C ratio. Existing capacity sufficient over the long-term.
Highway – Long Haul	I-16 Macon-to-Savannah widening	0.28	N	Low B/C ratio. Existing capacity sufficient over the long-term.
Highway- Smaller Urban and Rural Freight	US 84 widening	0.63	Y	Modest B/C. Important truck route: Connectivity to/from Savannah Port and very significant east-west truck volumes. GRIP-designated route.
Highway- Smaller Urban and Rural Freight	State Route 133 widening	0.63	Y	Modest B/C. Important truck route: Improved connectivity for Albany area military base and manufacturers (plus agricultural products of Southwest Georgia) to I-75 and points south. State Route 133 also a GRIP-designated route.
Highway - Smaller Urban and Rural Freight	Central Georgia: US 441 widening	0.62	Y	Modest B/C, however important truck route: Regional Connectivity, alternative north-south route around metro Atlanta, & GRIP.
Highway - Smaller Urban and Rural Freight	Central Georgia: US 280 widening	0.01	N	Low B/C ratio. GRIP route.
Highway - Smaller Urban and Rural Freight	Central Georgia: 'Fall Line Freeway'	-	Y	GRIP route. (<i>now under construction</i>)
Highway – Bypass	Macon-to-LaGrange improvement plus four-laning the remainder of US 27 north of LaGrange, GA	5.29	N	High B/C ratio (<i>benefits compound with later implementation</i>). Alternative north-south route around west metro Atlanta.

⁵² www.annistonstar.com/news/article_3b3a9b86-fe57-11e3-a06e-0019bb2963f4.html

Project Category	Location/Project	B/C Ratio (or other benefit)	Immediate Priority?	Comments
Highway – Bypass	I-75 “Bypass” north Georgia & metro Chattanooga, TN.	2.94	N	High B/C ratio. Proposal initiated in Tennessee transportation plans. No solid commitment to pursue in Tennessee.
Highway – Bypass	North Metro Atlanta Bypass: new alignment/roadway	0.93	N	Modest Freight B/C ratio; autos received most benefits.
Highway – Bypass	West Metro Atlanta Bypass: new alignment/roadway	0.69	N	Lower B/C ratio than a Macon-to-LaGrange improvement plus completing US 27.
Highway – Interchange	Atlanta, GA: I-285 at I-85 (North) reconstruction	6.11	Y	High B/C ratio. Key truck interchange and nationally-identified (ATRI/FHWA) bottleneck.
Highway – Interchange	Atlanta, GA: I-285 at I-75 (North) reconstruction	4.41	Y	High B/C ratio. Key truck interchange and nationally-identified (ATRI/FHWA) bottleneck.
Highway – Interchange	Atlanta, GA: I-285 at I-20 (West) reconstruction	1.59	Y	High B/C ratio. Key truck interchange and nationally-identified (ATRI/FHWA) bottleneck.
Highway – Interchange	Atlanta, GA: I-285 at I-20 (East) reconstruction	3.85	Y	High B/C ratio. Key truck interchange and nationally-identified (ATRI/FHWA) bottleneck.
Highway – Interchange	Atlanta, GA: I-285 at I-85 (South) reconstruction	0.04	N	Low Freight B/C ratio. Not identified as a major bottleneck.
Highway – Interchange	Atlanta, GA: I-285 at I-75 (South) reconstruction	0.33	N	Relatively Low Freight B/C ratio for a total reconstruction, but operations project feasible.
Highway – Interchange	Atlanta, GA: I-285 at State Route 400 interchange reconstruction	n/a	Y	Nationally-identified (FHWA) bottleneck. Georgia Freight & Logistics Plan’s <i>Task 3 Truck Modal Profile</i> (Appx. B) Truck GPS data revealed significant truck delays at this location [“through” truck traffic to/from State Route 400 not allowed ‘inside’ I-285 per Georgia Code section 40-6-51; so they must use interchange to go from one route to the other. ^{53]}
Highway – Interchange	Macon, GA: I-75 at I-16 interchange reconstruction	7.58 ⁵⁴	Y	Stakeholder feedback noted this was important interchange to the state and Macon region. Nationally-identified (ATRI/FHWA) bottleneck.
Highway – Interchange	Savannah, GA: I-95 at I-16 interchange reconstruction	0.97	Y	Nationally-identified (ATRI/FHWA) bottleneck. Important freight connector for Savannah Port; included in Savannah MPO’s LRTP and TIP, as well as the GDOT Office of Planning’s “Chatham County Interstate Needs Analysis study”.
Highway – Interchange	Savannah, GA: I-95 at State Route 21 interchange reconstruction	0.29	Y	Recommended in Savannah MPO’s LRTP and GDOT “Chatham County Interstate Needs Analysis study”. Important freight interstate interchange for Port of Savannah. Relatively Low Freight B/C ratio for a total

⁵³http://dps.georgia.gov/sites/dps.georgia.gov/files/related_files/site_page/07%20-%20Trucks%20Using%20Multi-Lane%20Highways.pdf

⁵⁴ GDOT’s TIGER 2011 funding application submitted to US DOT

Project Category	Location/Project	B/C Ratio (or other benefit)	Immediate Priority?	Comments
Highway – Operational	Atlanta: GA: State Route 6 (State Route 6) “Truck Friendly” Lanes	n/a	Y	reconstruction in the shorter term (however major operations project feasible now.) In Atlanta MPO’s LRTP TIP, and State Route 6 Corridor Study ⁵⁵ , Vital “last-mile” connection from I-20 to NS rail intermodal terminal. Designated intermodal connector (“truck/rail facility GA55R and GA56R”).
Highway – Operational	Savannah, GA: Grange Road improvement	1.8 ⁵⁶	Y	High B/C ratio. Improved last-mile connection between 100% state-funded Jimmy Deloach Parkway Extension (now under construction to provide direct truck access between port & I-95) and port’s forthcoming new “Mason Gate” ⁵⁷ truck access point on Grange Road. Grange Road is also US DOT-designated Intermodal Connector (“port terminal, Facility ID no. GA33P”). More project details in F&L Plan’s Task 3 Marine Profile.
Highway – Operational	Savannah, GA: Brampton Road	n/a	Y	New last-mile route directly connecting port’s truck gate #3 (on Brampton) to I-516. Brampton Road is a US DOT-designated Intermodal Connector (“port terminal, Facility ID no. GA24P”). Project details in F&L Plan’s Task 3 Marine Modal Profile.
Highway – Operational	Various: Improve Median Barriers	tbd	tbd	Low cost safety improvement alternative
Highway – Operational	Metro Atlanta: Expand the TRIP ⁵⁸ Program	11.0 ⁵⁹	Y	Reduces incident/crash clearance times, focused on those involving large trucks. (See program details later in this document)
Air Cargo	Hartsfield-Jackson Atlanta airport: Additional warehouse facilities	Additional cargo storage	Y	Stakeholders said priority air cargo for Atlanta airport. New building C of South Cargo Complex now under construction (est. finish Nov. 2015) will complete South Cargo Facility on South Loop Road and be same size, appearance and function as three existing facilities; have 128,566 ft ² & include landside improvements of truck staging & relocate airfield access gate ⁶⁰ .
Air Cargo	Albany, GA airport: Extend runway	Add'l air cargo aircraft capabilities	Y	Stakeholder feedback indicates a priority air cargo project. Airport has UPS sort facility.

⁵⁵ http://comdev.cobbcountyga.gov/documents/SR6_Final-Rpt_1-8-08.pdf

⁵⁶ GDOT’s TIGER 2014 funding application submitted to US DOT

⁵⁷ www.gaports.com/Departments/Engineering/Projects/tabid/563/bidid/136/Default.aspx

⁵⁸ www.timetaskforce.com/time-initiatives/trip

⁵⁹ http://ops.fhwa.dot.gov/eto_tim_pse/preparedness/tim/knowledgebase/resources/doc_details.cfm?document_id=38&from=search

⁶⁰ www.atlanta-airport.com/Airport/Construction

4.2 GROUPING HIGHWAY PROJECTS INTO PACKAGES

Highway projects were grouped into packages based on geographic location along priority highway corridors in the state. The most significant freight flows in the state based on truck tonnage and key freight facilities can be ranked into the following seven corridor categories:

1. Savannah-to-Atlanta Corridor
2. Atlanta-to-Tennessee Corridor
3. Atlanta-to-South Carolina Corridor
4. Macon-to-Florida Corridor
5. Atlanta-to-Alabama Corridor
6. Through Freight Corridors
7. Smaller Urban and Rural Freight Corridors

Figure 4.1 below shows the first five of these corridors. A map of the smaller urban and rural freight corridors is shown in Figure 4.2 below; it shows the recommended projects in each of the corridors.

Table 4.2 Recommended Projects Included in Each of the Highway Corridor “Packages”

Corridor	Recommended Projects Included
Savannah-to-Atlanta	I-75 capacity from Atlanta to Macon; Macon interchange I-75@I-16, Savannah interchanges I-95@I-16 and I-95@ State Route 21; and “last mile” Port of Savannah connector projects (Grange Road and Brampton Road).
Atlanta-to-Chattanooga	Metro Atlanta interchange: I-75@I-285 North
Atlanta-to-South Carolina	I-85 capacity from Atlanta metro to SC and metro Atlanta interchanges I-285@I-85 North and I-285@I-20 East
Macon-to-Florida	No additional capacity-adding projects recommended
Atlanta-Alabama	I-20 capacity between Atlanta metro and Alabama; I-85 capacity between metro Atlanta & Alabama; and metro Atlanta interchange I-285@I-20 West
‘Through’ Freight Corridors	Chattanooga “Bypass”, Macon-to-LaGrange improvement plus remainder of the US 27 four-laning north of LaGrange
Smaller Urban and Rural Freight Corridors	Complete the four-laning of US 84, US 441, and State Route 133. Consider safety improvements off the interstate system

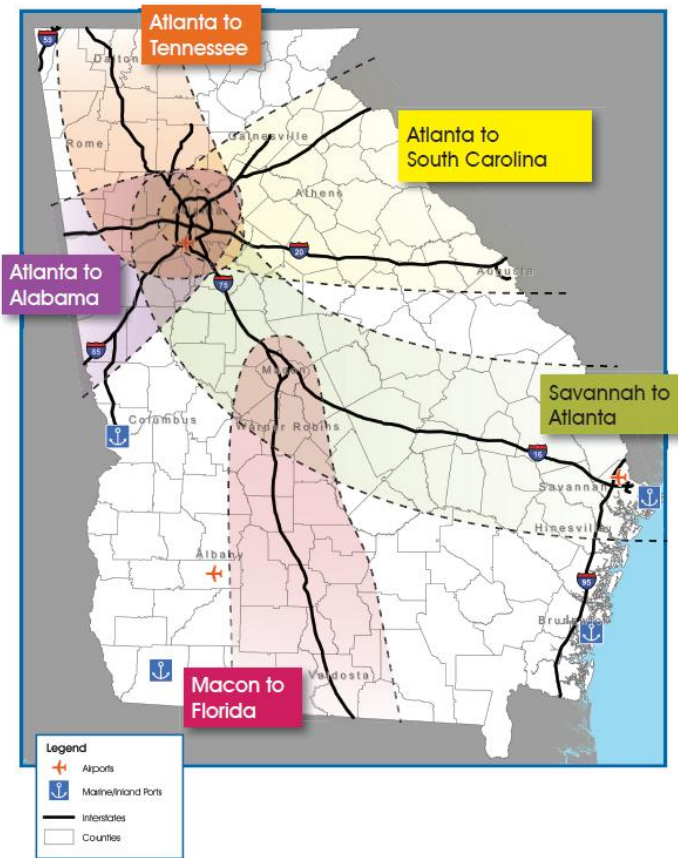


Figure 4.1 Significant Highway Corridors

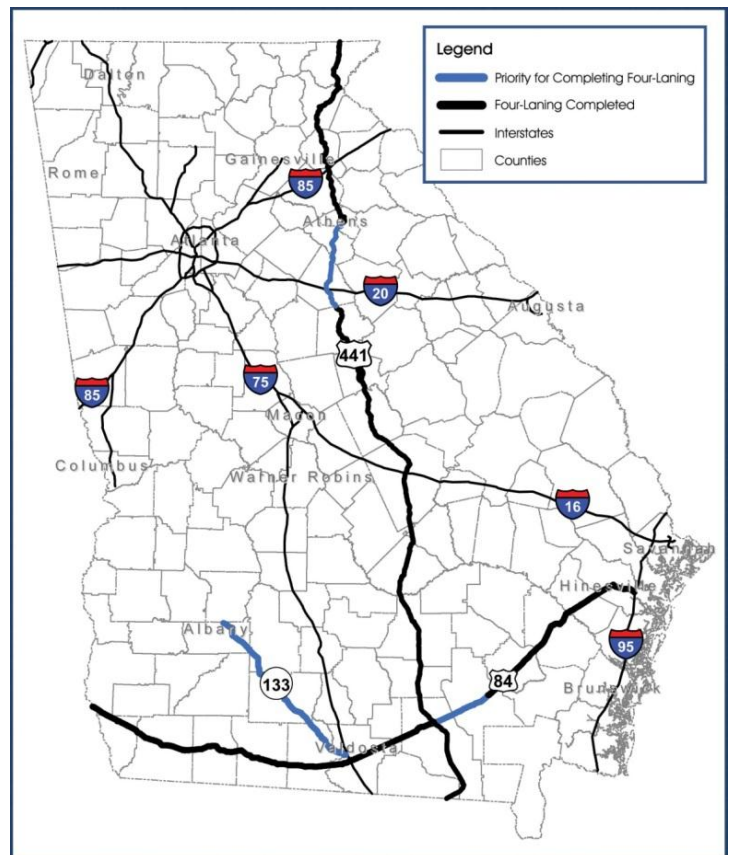


Figure 4.2 Smaller Urban and Rural Freight Corridors

5.0 Economic Impact Analysis

5.1 OVERVIEW OF METHODOLOGY

The tool used to model the economic impact of highway improvement projects and to calculate the return on investment is the REMI Transight Macroeconomic Simulation Model. The fundamental structure of the REMI model incorporates detailed inter-industry transactions of intermediate goods in the production process, and interrelated final demand feedbacks that captures the dynamic relationship between income and spending. The REMI model is appropriate for analyzing the regional economic impacts of the investment packages because the model accounts for how relationships between prices, costs of doing business, and demographic variables interact with other important economic variables such as employment, gross regional product, and personal income to influence economic performance.

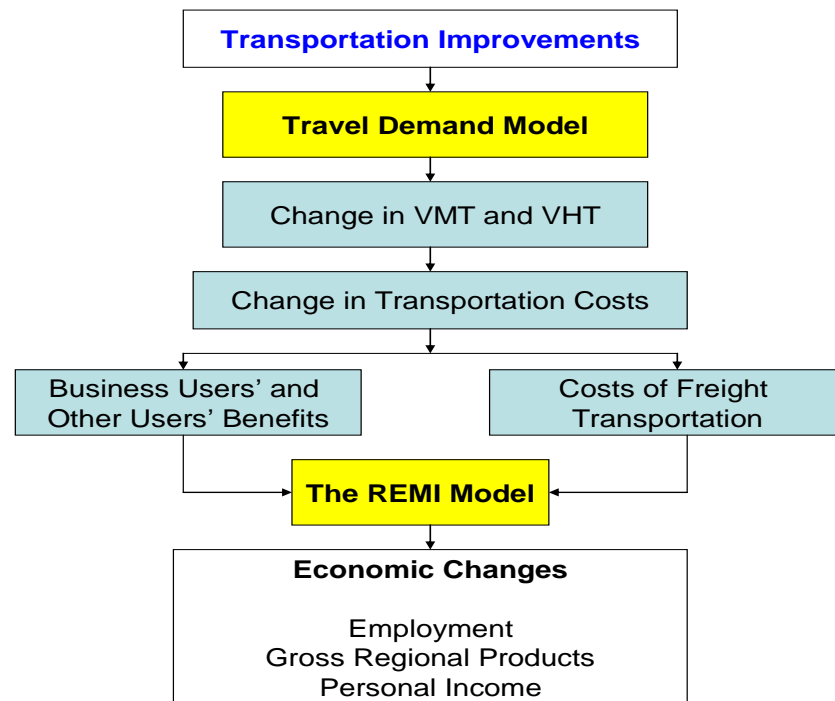
To estimate the economic impact of the investments, travel efficiency gains are mapped to households and businesses, depending on the beneficiary. Travel efficiency gains arising from personal travels (commute and non-work related trips) are disaggregated into explicit (out-of-pocket) and implicit gains (savings). Explicit gains associated with safety, vehicle operating costs and travel time are mapped to households. In accordance with U.S. Department of Transportation guidelines, only half of the travel time gains are mapped to households. These gains serve as input into REMI as changes in consumer spending in order to estimate total impact due to households.

Similarly, travel efficiency gains arising from business related trips (trucks and business related auto trips) are mapped to industry. The gains or savings mapped to industry are further distributed across various industries in Georgia based on each industry's dependency on transportation usage. Each industry's dependency on transportation usage is equivalent to its transport cost relative to output, and it is estimated as the product of transportation cost per dollar of output and the industry's output. For this study, transportation cost per dollar of output provided by the Transportation Satellite Accounts (TSA) in conjunction with 2009 output provided by REMI are utilized to estimate the relative cost of transportation across industry. Industry related savings serve as input into REMI as changes in business cost. The resulting total impacts are expressed as changes in employment, gross state product (GSP), and personal income.

Economic impact is measured as changes in economic activity in a given region, arising from a project or a change in policy. It can be expressed in various economic variables including sales (output), employment, and personal income (earnings). Reduction in transportation cost and improved connectivity to domestic and international markets arising from roadway capacity expansion

increases output of firms (especially export oriented manufacturing industries) and increases demand for key factors of production including labor, materials, equipment, and supporting downstream activities which are supplied by other local and non-local firms. This chain of activities leads to local economic contraction through increased employment, personal income, and business profits. Generally, total assessment of economic impacts comprises estimation of three impact types, namely direct, indirect and induced. The relationship between the Travel demand model, REMI and the various input and output variables are shown in Figure 5.1.

Figure 5.1 Analytical Framework for Benefit-Cost and Total Economic Impact Analyses for Proposed Corridor Investments



Direct Impacts

Direct impacts associated with roadway capacity improvement are the direct effects of changes in output (sales) or production cost, and spending in key economic industries including wholesale and retail trades, manufacturing, and transportation and logistics. For instance, the direct effect of improved roadway to a manufacturing firm is the reduction in crew and inventory costs.

To estimate the economic impact of the proposed study, the user benefits are disaggregated into explicit and implicit benefits. The explicit benefits are mapped to the beneficiaries. This implies that explicit benefits accruing to commute and non-work related personal travels are mapped to households,

while those associated with truck and business related personal travels (changes vehicle operating costs, safety cost, and travel time) are mapped to industry.

Explicit cost mapped to industry is further distributed across industry based on each industry's transportation usage, determined by transport cost relative to output. This is estimated as the product of transportation cost per dollar of output and the industry's output. For this study, transportation cost per dollar of output provided by the Transportation Satellite Accounts (TSA) in conjunction with 2009 output for Georgia provided by REMI are utilized to estimate the relative cost of transportation across industry. The equation below provides the basis for distributing the explicit benefits across industry. Each industry's share of benefit represents change in cost of doing business (or production cost).

$$\Delta V_i = \Delta V^{Total} \times \frac{C_i Q_i}{\sum_i C_i Q_i}$$

Where,

ΔV_i = Cost change associated with industry "i"

ΔV^{Total} = Industry cost change (aggregate)

C_i = Transportation cost per dollar of output, reported by the Transportation Satellite Account

Q_i = Output of industry "i" (2009 output reported by REMI)

The explicit cost savings across industry serves as input into as a reduction in production cost for economic simulation and estimation of economic impacts.

Similarly, changes in explicit benefits associated with personal travels (except business) are mapped to households. These changes are entered in REMI as changes in consumer spending for simulation and estimating economic impacts.

Indirect and Induced Impacts

As business sale increases, demand for key input materials also increases in tandem, and vice versa. Therefore, the indirect impact associated with increased business sale (output) is estimated or referred to as increase in demand (purchases) for key input materials by local firms who are the direct suppliers to these businesses. For example, increased construction activities increase the demand (purchases) for steel, concrete, timber, fuel etc. Consequently, spending on factors of production stimulate expansion of businesses downstream of the production chain. Accordingly, changes in output, employment, and income arising from these expansions are considered to be indirect impacts.

Direct and indirect impacts are the sources of induced impacts, and it normally constitutes the largest portion of total impacts. Changes in output, employment, and income, stemming from household consumption of goods and services are induced impacts. Similar to indirect impacts, increase or decrease in personal

consumption also lead to increase or decrease in business sales (output). This chain of activities also translates into changes in employment, and income.

Output from REMI simulation provides total economic (direct, indirect and induced) impact associated with the project.

5.2 SUMMARY OF RESULTS FOR HIGHWAY CORRIDOR “PACKAGES”

The economic impacts in terms of job growth and Gross State Product (GSP) growth for each package of projects are shown in Table 5.1 below. In addition, the return-on-investment (“ROI”) is also calculated as the ratio between total long term economic benefit and total cost, with total returns calculated at the time of implementation in Table 6.2. It tells us, for one unit of cost, how many units of long term benefits we can get.

Table 5.1 Summary of Economic Impact Analysis Results

Corridor	Projects Included	Cost (\$Millions)	Increase in GSP (\$Millions)	Increase in Employment (Annual)	ROI
Savannah-to-Atlanta	I-75 capacity between metro Atlanta and Macon; Macon interchange I-75@I-16; Savannah interchanges I-95@I-16 and I-95@State Route 21; and Port of Savannah “last mile” connectors (Grange Road and Brampton Road)	\$1,950	\$9,100	2,426	4.7
Atlanta-to-Chattanooga	Metro Atlanta interchange I-75@I-285 North	\$200	\$90	39	0.4
Atlanta-to-South Carolina	I-85 capacity between Atlanta and SC and metro Atlanta interchange I-85@I-285 North	\$1,400	\$7,200	1,901	7.3
Macon-to-Florida	No major capacity-adding highway improvement projects recommended	n/a	n/a	n/a	n/a
Atlanta-Alabama	I-20 capacity between Atlanta metro and Alabama; I-85 capacity between Atlanta and Alabama; and west metro Atlanta interchange I-20@I-285	\$ 2,000	\$9,800	2,443	4.0
Chattanooga Bypass	Chattanooga “Bypass”	\$800	\$6,400	1,681	10.7
Macon-to-LaGrange impvt. and US 27	Macon-to-LaGrange improvement plus remainder of US 27 four-laning north of LaGrange	\$ 480	\$11,300	2,738	18.0
Smaller Urban and Rural Freight Corridors	Complete the four-laning of US 84, all of State Route 133, and portions of US 441	\$522	2,180	508	4.2

6.0 Summary of Freight Recommendations

By investing \$18-20 billion over the next 40 years in road, rail, airport and marine capacity, new rail terminals and line haul capacity, improved Interstate interchanges, limited access bypasses, and high volume rural freight corridors, the State could generate over \$77 billion in additional economic output and thousands of new jobs. Table 6.1 lists the project categories for each mode along with costs and benefits.

These benefits include the economic benefits that will accrue from the two large port improvement projects: deepening the Savannah Harbor and building a new port in Jasper. The Savannah Harbor Expansion Project General Reevaluation Report has estimated that the harbor deepening will result in over \$2 billion in transportation cost savings. The March 2011, the Jasper Ocean Terminal update estimated that the new port would generate over \$9 billion in additional tax revenue and over one million jobs to Georgia and South Carolina. These benefits are only a portion of the total economic benefits that the port improvement projects will bring to Georgia.

Table 6.1 Summary of Recommended Improvements

Mode	Projects and Project Categories Included	Cost (\$Millions)	Increase in GSP (\$Millions) or Other Benefits
Port	Deepen Savannah Harbor	550	2,800 trans. cost savings ⁶¹
	Develop Jasper Port	4,000 ⁶²	9,000 add'l. tax receipts in Georgia & South Carolina
Rail	Pursue Crescent Corridor initiative Improvements to other terminals and mainlines	4,000 to 6,000	13,200 to 19,800
Highways	Add capacity to select long-haul corridors		
	Improve congested interstate interchanges		
	Develop key bypass routes		
	Improve key smaller urban & rural freight corridors	9,542	52,480
	Improve "last-mile" connectors: Savannah (Grange Road & Brampton Road) & Atl. (S.R. 6) Highway Safety Improvements		
Air Cargo	Add warehouse capacity at Atlanta airport		Add'l. air cargo capabilities (quantitative data not available at time of study adoption)
	Lengthen airport runway at Albany airport	15 to 20	
TOTAL		18,017 to 20,112	65,680 to 72,280

⁶¹ Does not include benefits from marine port improvements

⁶² This was the estimate at time study first adopted; as of May 2014 the cost estimate is \$3 billion (source: www.miamiherald.com/2014/05/22/4131638/savannah-river-can-apparently.html)

6.1 FUNDING FREIGHT IMPROVEMENT PROJECTS

Identifying funding for freight projects is a challenge. There are a variety of potential sources that differ somewhat for each of the freight modes:

- Nationally, several port-related projects have been funded by the Harbor Maintenance Trust Fund. However, the appropriations from this fund have been inadequate to fund the full range of national port needs. Therefore, major harbor deepening projects such as the proposed Savannah harbor deepening have more often been funded through general funds at the Federal and state level. The State of Georgia has committed a portion of the funds required for deepening the harbor, while the remainder of these funds is expected to be provided by the Federal government based on the national need to expand the export and import capabilities of the Port of Savannah.
- The vast majority of freight railroad projects will be funded by the private sector. However, the initial round of the American Recovery and Reinvestment Act (ARRA) provided over \$100 million for the development of the Crescent Corridor primarily focused on developing new intermodal rail yards in Birmingham and Memphis. A handful of other freight-related projects were also funded through the ARRA program. There may be the potential for future Federal grant related sources to be targeted towards freight rail as well, particularly as improvements are made to accommodate passenger rail service on freight rail lines.
- Highway projects that benefit freight are eligible for the same funds as other highway program projects. They often require a financial plan that includes a variety of funding sources. Many states utilize a mix of motor fuel taxes, sales taxes, parking fees, license tag fees, registration fees, tolls, and public-private partnerships to fund highway projects. However, as noted in the GDOT Statewide Strategic Transportation Plan, Georgia's share of non-motor fuel tax revenues has historically been relatively low compared to other states in the country. In 2010, the Georgia State Legislature passed the Transportation Investment Act (TIA) which had the potential to increase funding for transportation in Georgia by over \$18 billion over the next 10 years. This is discussed on the next page in more detail.
- Air cargo projects are also paid for through a combination of Federal, state, and local funding. Development of on-airport warehouse building facilities are typically paid for by the airport operators (e.g., the City of Atlanta for the Atlanta airport) and then reimbursed through rental contracts over time. Runway extensions, such as the one needed in Albany, are funded through a combination of FAA and local funding. However, outside sources of funding are also possible, and can accelerate projects that are considered to be critical.

Several of the projects on these lists coincided with the recommended freight improvement projects listed in this Freight & Logistics Action Plan. Therefore, the passage of TIA throughout the State was an opportunity to provide the key driver in the implementation of many projects recommended by the Freight & Logistics Action Plan.

Transportation Investment Act of 2010

In response to historically low levels of funding for transportation projects in Georgia, the Georgia State Legislature passed the Transportation Investment Act (TIA) of 2010. This plan created 12 special tax districts in Georgia, and gave each district the ability to levy a one percent sales tax for up to 10 years to fund transportation projects in its region. Details on the law and the TIA program are on the internet at: www.ga-tia.com.

To be enacted, the sales tax would have needed approval by majority vote in each district based on an election held in July of 2012. The money raised in each district would have been used on transportation projects in the district. It is estimated that if the TIA project lists were passed in all 12 Georgia districts that over \$18 billion of new transportation funding would have been generated over the coming 10 years.

Each of the 12 districts identified a list of projects that were included on the ballot. Approximately \$500 million of the projects on the TIA project lists overlapped with the recommended freight improvement projects from the Freight & Logistics Action Plan. The passage of the TIA project lists throughout the State would have accelerated the implementation of the Freight & Logistics Action Plan.

Unfortunately, results of the July 2012 election showed that none of the major freight projects recommended in the Georgia Statewide Freight and Logistics Plan were located in the three districts of the state where voters approved the TIA program.

6.2 POTENTIAL FREIGHT & LOGISTICS ACTION PLAN TIMELINE

Based on feedback from the private sector, information from previous studies, and the return-on-investment analysis discussed earlier in this report, a proposed timeline for the major Freight & Logistics Plan (not including such projects as those listed in Table 2.2) is shown in Table 6.2 on the next page.

Table 6.2 Freight & Logistics Action Plan Timeline

		2012-2020	2021-2030	2031-2040	2041-2050
Marine Port Improvements	Deepen Savannah Harbor	●			
	Develop Jasper Port		●		
Rail Improvements	Line Haul Expansion	●	●	●	●
	Intermodal and Carload Terminal Expansion	●	●	●	●
	Increase Weight Limits and Vertical Clearances	●	●		
	I-285 @ I-75 North		●		
Interstate Interchange Improvements	I-285 @ I-85 North	●			
	I-285 @ I-20 West	●			
	I-285 @ I-20 East		●		
	I-75 @ I-16 in Macon	●			
	I-95 @ I-16 in Savannah	●			
	I-95 @ SR 21 in Savannah	●			
	I-85 between Atlanta Metro and South Carolina	●	●		
Long-Haul Highway Corridor Improvements	I-75 between Atlanta Metro and Macon metro		●		
	I-85 between Atlanta Metro and Alabama			●	
	I-20 between Atlanta Metro and Alabama				●
	Chattanooga Metro Bypass		●		
Highway Bypasses	Macon-LaGrange – U.S. 27			●	
	Complete 4-laning U.S. 84	●			
Rural and Smaller Urban Highway Corridor Improvements	4-laning SR 133 from Albany to Valdosta		●		
	4-laning U.S. 441 fro I-85 to I-16		●		
	Safety Improvements	●			
	Additional Air Cargo Warehouse at Atlanta Airport	●			
Air Cargo Improvements	Extend Runway at Southwest Georgia Airport in Albany	●			

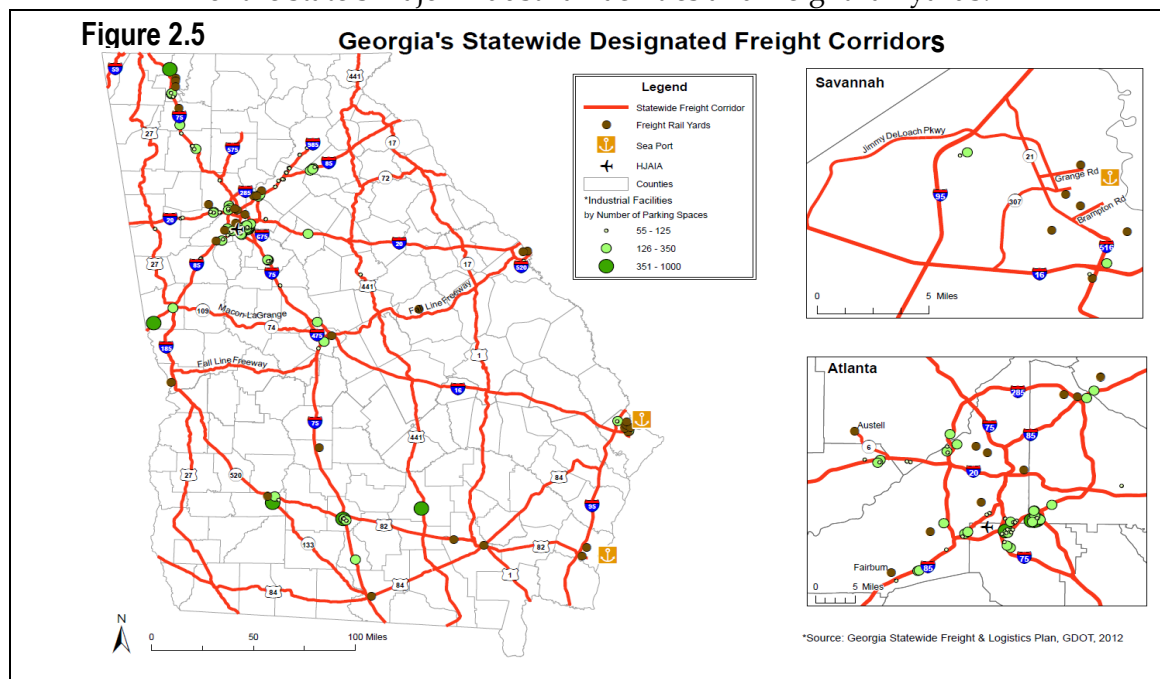
6.3 FREIGHT CORRIDORS: STATE & METRO ATLANTA

Statewide Freight Corridors

Since initial adoption of the Georgia Statewide Freight and Logistics Plan in February 2012, the State Transportation Board approved another key state freight policy in August 2013.⁶³ Known as the Georgia Statewide Freight Corridors, this policy was grounded in findings from the Plan and represents a cohesive and complete map of Georgia's priority roads for freight movements. Corridors include all interstate roadways, key freight-intensive GRIP (rural four-lane) routes, and several "last-mile" connector roads to freight activity centers such as to a metro Atlanta intermodal rail terminal and at the Port of Savannah.

The Statewide Freight Corridors policy is grounded in Georgia House Bill 202 approved by the Legislature in their 2013 session and signed by the Governor on April 18, 2013. Effective July 1, 2013, it states that roads on the Statewide Freight Corridor are exempt from Georgia's congressional balancing law related to transportation dollars spent on the routes.

The corridors are vital to the state's freight and logistics industries; they represent approximately 15% of the roadways operated by GDOT, yet provide for efficient north-south, east-west and 'last-mile' access for moving cargo and goods. Figure 2.5 shows they are some of the highest truck percentage routes that connect most of the state's major industrial facilities and freight rail yards.

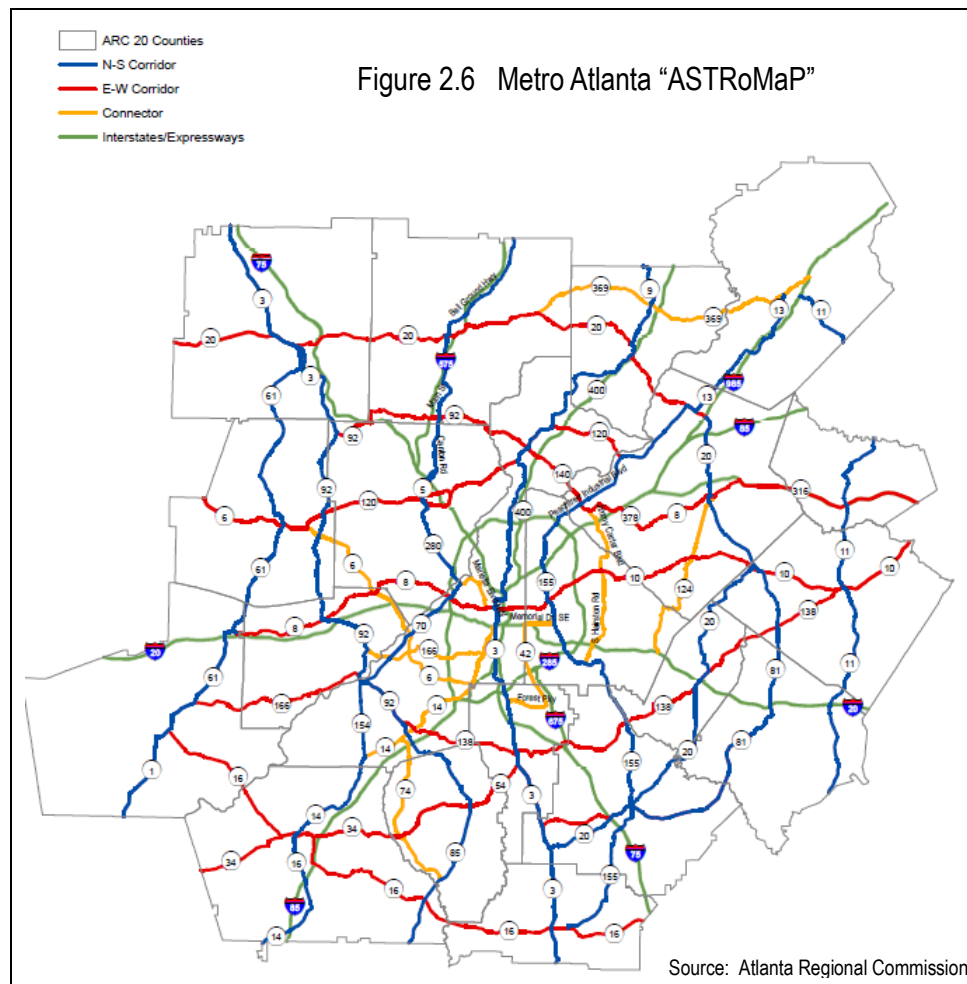


⁶³ www.dot.ga.gov/informationcenter/pressroom/PressReleases/FreightCorridorDesignationAug2013.pdf

Metro Atlanta: Strategic Truck Route Master Plan (“ASTRoMaP”)

Just as the Georgia Statewide Freight Corridor identified the longer-haul state-level freight routes, region-level freight routes in metro Atlanta were the focus of the Atlanta Regional Commission (ARC) who identified the north/south and east/west *non-interstate* routes that primarily handle most of the truck-based freight movement in metro Atlanta.

Specifically, ARC designated regional truck route network with associated policies and guidelines. Known as the **Atlanta Strategic Truck Route Master Plan** (“ASTRoMaP”), it was adopted by ARC in June, 2009 and is shown in the figure below. Additional information is at: www.atlantaregional.com/transportation/freight.



Metro Atlanta: GDOT & ARC Freight Operations & Safety Program

Relatively recently, GDOT and ARC partnered on the creation and funding of a metro Atlanta Freight Improvement Program with a goal to “enhance -- as quickly and efficiently as possible -- the regional freight transportation network that serves the regional economy.” The program proposes to fund short-term freight projects on the ASTRoMaP network, with typically have significant cost/benefit ratios and would be typified by smaller-scale projects that can be designed and delivered in a timely manner.⁶⁴

6.4 Operational Improvement Strategies

Metro Atlanta : Intelligent Transportation Systems (ITS)

GDOT’s Intelligent Transportation Systems (ITS) is also a significant component of maintaining safe and efficient traffic operations of interstates in metro Atlanta. This is important for this region – an area of Georgia that the State Freight & Logistics Plan identified as the major freight-intensive areas of the state and vital to its economy.

This system monitors traffic flow via automatic sensors and cameras, and provides real-time travel information to all drivers. Information alerting drivers of incidents ahead and delays anticipated is dispatched in many ways: a dedicated toll-free phone number to reach a live operator 24/7; changeable message signs (“CMS”) throughout the state; an internet website operated by GDOT (www.511ga.org); phone apps, and via broadcast media. The system is also served with a fleet of GDOT highway emergency response operators “HEROs” (www.511ga.org/static/hero-faqs.html) who are coordinated with local emergency service responders (police, fire and state patrol.)

One of the newest components of the ITS system in Atlanta is the I-285 ‘variable speed limit’ policy which was approved⁶⁵ in late 2012. Focused on the section of I-285 north of I-20, the project uses *existing* detection systems to monitor the flow of traffic and harmonize speeds to increase throughput *and* reduce crashes by raising the default speed limit to 65 mph from 55 mph and vice versa, when appropriate. In addition to being a major commuter route, the affected section of I-285 is a high truck volume corridor, so the initiative’s objective to smooth traffic flow and reduce crashes/incidents should directly benefit for freight-moving trucks on that corridor. Additional information on the project is available on the GDOT website at: www.dot.ga.gov/travelingingeorgia/Pages/VSL.aspx.

⁶⁴ www.atlantaregional.com/File%20Library/Transportation/Freight/Tp_PLN2040FreightOps_091412.pdf

⁶⁵ <http://georgia.gov/blog/2012-09-26/electronic-speed-limit-signs-approved>

Metro Atlanta: Regional Traffic Operations Program (“RTOP”)

One key operations initiative GDOT’s RTOP program -- a multi-jurisdictional signal timing program that improves traffic flow and reduces vehicle emissions through improved and coordinated corridor signal timing.

The difference between this effort and a normal signal timing operations is that GDOT provides additional signal timing personnel focused solely on metro Atlanta’s busiest arterial roadways. Because corridors cross city and county boundaries, this GDOT program works with local governments to make signal timing seamless. Detailed performance data is available at: www.dot.ga.gov/travelingingeorgia/trafficcontrol/Pages/Operations.aspx.

Metro Atlanta: Downtown Connector Operational Improvements

The Downtown ‘Connector’ in Atlanta, which is the four-mile stretch of interstate where I-75 and I-85 are co-routed through the heart of the city, can be a significant freight bottleneck with regards to the movement of delivery trucks. In an effort to reduce congestion at this location in a cost effective way, operational improvements were recently made to the Connector. In 2003, GDOT re-striped and extended a divider wall to add ramp storage and reduce weaving at three exit ramps. It was then in 2005 that GDOT installed four southbound entrance ramp meters -- at the existing interchanges with Spring Street, Ellis Street, Freedom Parkway, and Edgewood Avenue, yielding significant improvements to traffic flow on the Connector. In fact, GDOT estimates the ramp meters saved a weekly average of 17.3 percent in fuel and 22.4 percent times during the four-hour afternoon traffic peak period. In addition, between 2004 and 2005 the number of severe congestion hours was reduced by 37.7 percent.⁶⁶

Metro Atlanta: Traffic Incident Management Enhancement (“TIME”)

TIME is a metro Atlanta-focused taskforce of first-responders and transportation agencies who developed and sustain a regional incident management program to facilitate coordination of safe and fast roadway clearance that lessens the impact on emergency responders and motorists. It constantly seeks ways to improve inter-agency coordination and cooperation; create opportunities for multi-agency training to promote teamwork; and serve as a platform to develop common operational strategies and a better understand other agencies' roles and responsibilities.

⁶⁶ www.cedengineering.com/upload/Traffic%20Bottlenecks%20Operational%20Improvements.pdf

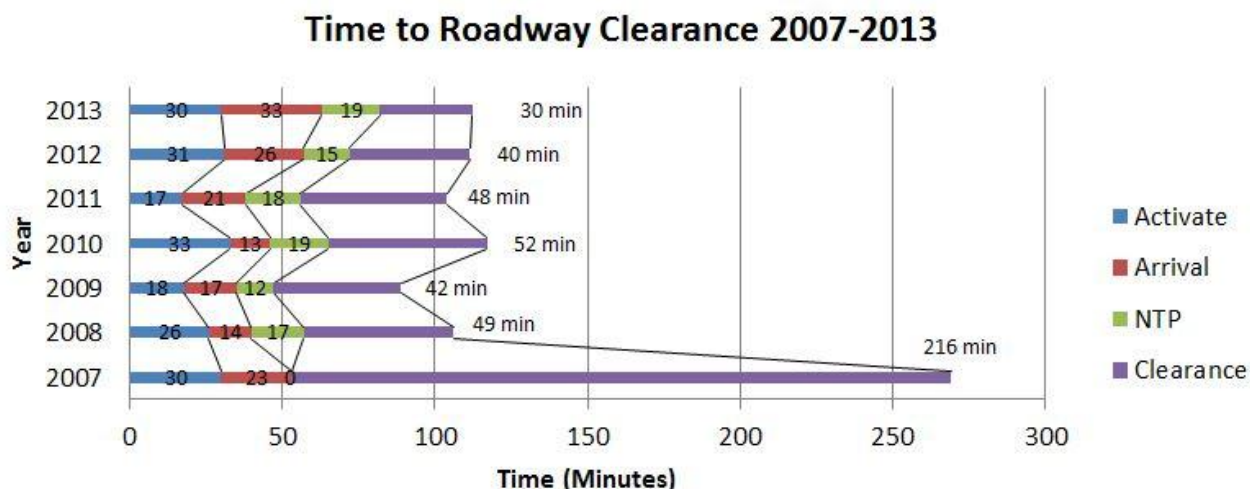
In addition to GDOT, the TIME taskforce currently has over 90 member organizations including the Federal Highway Administration; the Georgia Department of Motor Vehicle safety; emergency responders from cities and counties in metro Atlanta (police, fire, etc.); and towing companies.⁶⁷ Additional info is at www.timetaskforce.com.

Metro Atlanta: Towing and Recovery Incentive Program (“TRIP”)

One major initiative of the previously-mentioned TIME task force was creation of TRIP in 2007. TRIP is a quick-clearance program that provides a financial incentive/bonus for heavy-duty recovery/wrecker companies to remove large truck-involved crashes from affected travel lanes within 90 minutes. Prior to this program, clearance of large truck crashes could often take several hours causing significant travel delay.

TRIP operates on I-285 (Atlanta’s perimeter freeway with very significant truck volumes) and all radial interstates (I-20, I-75 and I-85) inside the perimeter plus the State Route freeways of GA-400 and GA-166. TRIP also operates up to 10 miles outside of I-285 on the significant truck corridors of I-20, I-75 and I-85. Expanding this program to cover a larger portion of metro Atlanta will extend the geographic scope of these benefits.

In its first full year, this program very effectively reduced crash clearance time for those involving large trucks by two-thirds.⁶⁸ The continued success of this program is evident as shown below:



Source: www.timetaskforce.com/index.php/time-initiatives

⁶⁷ www.gampo.org/docs/6-28-13_work_session/08-GDOT_Traffic_Operations-Michael_Roberson.pptx

⁶⁸ www.timetaskforce.com/index.php/time-initiatives

Metro Savannah: Traffic Operations and ITS

Since its creation for the 1996 Atlanta Summer Olympics (several venues were in Savannah), GDOT's ITS system still has significant presence in Savannah. This system continues to benefit the Savannah region – a region with the 4th-busiest container port in the nation and a major catalyst for the regional economy.

This is a region of significant truck traffic on its interstates and many state and local routes due to the presence of the Port of Savannah. In Savannah, ITS hardware installed along those interstates includes CMS to alert drivers of incidents or major advisories. As a coastal city, the GDOT ITS system also provides hurricane evacuation information via GDOT's traveler information website⁶⁹ as well as overview information on how hurricane evacuations are coordinated.⁷⁰

While GDOT continues working closely with Savannah, Chatham County and adjacent municipalities for traffic operations related issues, the Savannah MPO has recently embarked on a feasibility study of a countywide ITS and Traffic Control Center Strategic Plan, which is ongoing.

Metro Macon: Intelligent Transportation Systems (ITS)

CMS was recently installed north of the I-16/I-75 interchange and connected to GDOT's statewide ITS system. This interchange is vital to the movement of freight between the port and metro Atlanta, and is a major reconstruction project recommended in this plan. The CMS provides information on traffic incidents at this interchange so drivers can make alternate route choices.

It joins existing ITS components in Macon⁷¹, especially along I-475 which is the main interstate 'bypass' around Macon for I-75 truck traffic heading between metro Atlanta (and points north) to/from the southern portions of Georgia, I-10, and the large consumer population in Florida.

Statewide: Intelligent Transportation Systems (ITS)

On interstates outside metro Atlanta, probe technology blends road sensor data with data points from GPS-enabled vehicles provide traffic speeds and identification/response to incidents. Additional information for metro Atlanta, including the ITS strategic plan and ITS architecture status report, is available at: www.atlantaregional.com/transportation/roads--highways/intelligent-transportation-system.

⁶⁹ www.511ga.org/mobile/?action=view_static_content&template_id=hurricanes&trail=main_menu

⁷⁰ www.dot.ga.gov/travelingingeorgia/Documents/Hurricane/HurricaneBroch.pdf

⁷¹ www.itsga.org/Member%20News/GDOT%20Macon%20Cameras.pdf

Statewide: Truck *PrePass* program

Georgia is an active participant of the multi-state *PrePass* program which is an automatic vehicle identification (AVI) system enabling participating transponder-equipped trucks to be pre-screened and “bypass” Georgia’s interstate route weigh stations – of which there are 19 in total⁷² -- as well those of participating states along the interstate corridor. Not stopping at the multitude of weigh stations means trucks can stay in the travel lanes at highway speed -- eliminating the need to enter each weight station add cumulative delay to their trip.

⁷² www.prepass.com/services/prepass/SiteInformation/Pages/SiteInformationGeorgia.aspx

7.0 Highlights of the Georgia Statewide Freight & Logistics Plan

Over the course of the development of the Georgia Statewide Freight & Logistics Plan, several themes have been identified and reinforced in regards to the importance of goods movement in Georgia. These themes can be used to guide future policy and funding discussions regarding the Freight & Logistics Action Plan. It can also be used to guide the incorporation of freight and logistics into future work conducted by GDOT, the Georgia Department of Economic Development, and other key state agencies. These highlights include:

- Georgia has a world-class freight infrastructure that is critical to the State's economic competitiveness. This infrastructure was developed through several decades of outsized investment by both the public and private sector.

Over the last 20 years, this investment has decreased, and this has in part been a contributor to the economic stagnation of Georgia relative to the rest of the U.S. since the year 2000.

- By investing \$18-\$20 billion over the next 40 years in freight improvement projects, the State could generate over \$65 billion in additional economic output and thousands of new jobs.

This is consistent with the conclusion of the GDOT Statewide Strategic Transportation Plan and the state's *Investing in Tomorrow's Transportation Today* ("IT3") initiative.

- The Savannah Harbor Expansion Project is the state's top freight priority. Its importance to Georgia's economic competitiveness was reinforced both through technical analysis conducted by the U.S. Army Corps of Engineers and several rounds of input from the private sector as part of the Statewide Freight & Logistics Plan development.

- The vast majority of goods moved in Georgia are carried by truck. Interstate mobility is the critical need for Georgia's trucking industry.

Adding capacity to I-85 between the Atlanta metropolitan region and the South Carolina border is the greatest need in the State's long-haul corridor network.

- Freight rail is funded and operated by the private sector, but the efficiency of its operation has a tremendous impact on the

competitiveness of shippers in Georgia. Improvements in the State's rail track and rail terminals are needed over the long haul to continue effective movement of goods by this mode.

- Air cargo moves a small fraction of Georgia tonnage because it is typically high-value, time-sensitive goods, however adequate access to air cargo facilities should be maintained.
- Funding the project recommendations of a state Freight & Logistics Plan is a challenge not a unique only for Georgia.

Possible funding for freight came from the Transportation Investment Act of 2010⁷³ which allowed Georgia citizens to vote in July 2012 on a list of projects in their region; some regions included projects from the Georgia Freight & Logistics Plan. Passage of the initiative only happened in three regions with no Georgia Freight & Logistics Plan projects on their lists.

Funding Strategy: Solid Commitment By the State

Going forward, using traditional fund existing fund sources in the most strategic manner is vital. Consequently, Georgia is seeking U.S. DOT approval to utilize the funding-match flexibility offered by federal MAP-21 legislation⁷⁴ to funding freight projects in its FHWA-approved state freight plan.

In addition, much progress has also been made to further enhance flexibility options funding freight improvements. The new policy tools provided with the Governor's approval of Georgia House Bill 202⁷⁵ gives GDOT options for committing funds for strategic freight-focused investments throughout the state. This new law allowed the State Transportation Board to adopt Georgia's Statewide Designated Freight Corridors in August 2013 (see page 6-5). This designation, with its funding flexibility provisions for those routes, further demonstrates the state's commitment to funding key freight corridor improvements around the state using the limited resources that are available.⁷⁶

In metro Atlanta, GDOT's financial partnership with the Atlanta Regional Commission for a metro Atlanta *Freight Operations & Safety Program*⁷⁷ demonstrates commitment to improving the region's network by funding projects that improve the efficient movement of freight within the region.

⁷³ www.ga-tia.com

⁷⁴ <http://www.fhwa.dot.gov/map21/factsheets/freight.cfm>

⁷⁵ <http://gov.georgia.gov/press-releases/2013-04-18/deal-signs-bills-will-facilitate-major-transportation-projects-0>

⁷⁶ www.dot.ga.gov/informationcenter/pressroom/PressReleases/FreightCorridorDesignationAug2013.pdf

⁷⁷ www.atlantaregional.com/File%20Library/Transportation/Freight/Tp_PLN2040FreightOps_091412.pdf